Telephony.

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The Twelve Dollar Farm Rate.

A dollar a month does not go far enough after it gets into the telephone company's treasury to satisfy the manager who has to pay the upkeep and operating expenses on a big rural line system, and keep a little small change to hand over to stockholders once in six months. He has to cut too many corners, and run too many chances of getting caught short of a bank balance by a sleet storm, or a law suit.

Twelve dollars a year is too low for farmers' line service on the average system, with the quality and cost improved as it has been in the last few years. It is time to start after this rate. The farmers can afford to pay more—why should not they be induced to recognize value received?

Of course we know what the farmers do when it is proposed to raise the telephone rate. But can this go on forever? What is the best way to get this thing into better shape? Some have done it already.

A Touching, but Significant, Confession.

The good, old, reliable Boston *Transcript,* that blind and persistent endorser of monopoly in the telephone service, that stalwart stay in time of trouble of the sanctified Bell telephone interests, has at last let slip his dreadful secret—has finally drawn aside the covering from the quivering wound which has been so sedulously concealed all these years. It now declares openly and brazenly that *"A telephone system that 'has given entire satisfaction' is new to us."* Shades of the Sacred Codfish! What a revelation!

Here is the editorial utterance, wrung from a bitter soul, at a time, apparently, when its accumulated woes became too great to be borne:

> In this section of the country few of us know anything about the automatic telephone, which is in operation in many of the cities of the West. Its failure to make progress in the East has led most of us to take it for granted that it has not been successful, but the engineer-in-chief and other headquarters officers of the British Postoffice have recently made visits to the United States, and as a result the Postmaster General has decided to introduce experimentally into that country the automatic exchange, as it is working in the United States. It will be remembered that the British government is preparing to take over the entire telephone business under the direction of Professor D. C. Jackson, of Boston. So this experiment with the automatic telephones will be of considerable interest to us. What will be news to many is the statement made that "about seven years ago one of the first of these lines was erected at Albuquerque, New Mexico, has given entire satisfaction, and is still in operation!" A telephone system that "has given entire satisfaction," is new to us!

What ho! Varlets! To the dungeon with this contumacious wretch! Having once slipped his leash, who can foretell what may happen? Of course competitive operation has produced and is producing service from two companies in a given field, which is "entirely satisfactory," but a Boston editor could hardly be expected to know that.

Preventing Inductive Disturbances.

No more baffling problem is presented to the manager of the average small system than the condition evidenced by the presence of noise on the lines, due to inductive action of electric light or power transmission circuits. The intangible nature of the disturbing influence, the usual lack of knowledge of the quality and quantity of the light or power currents, inaccuracy of information bearing upon the extent and time of their variation, and a large degree of ignorance of what elements actually influence telephone conditions, and how they do so, all combine to create the impression of a hopeless maze of difficulties. Cut-and-try-methods are seized upon, but instead of serving as guiding threads leading to a happy exit, they seem only to pile up expense accounts, and provoke a waste of time in wholly unproductive thought.

Transpositions may be cut in without a plan founded upon sound technical calculations, based upon accurate and essential data, and even make matters worse. An occasional lucky hit gives no assurance that the same device will solve the next mystery, for the problem is one of eternal variation.

The services of an engineer of broad training and special experience in this class of work are almost invariably necessary for an economical and satisfactory solution of such a difficulty. The hard task has always been to secure such services at an expense which will appear as true economy, or which the directors, not knowing how the treasury will be affected by driblets of wages wasted in useless construction changes, will authorize at the start. But there is no question but that competent advice obtained at the start on an economical basis would be a means of saving money in the end.

If the facts in the case are completely and accurately presented, by suitably written descriptions and carefully prepared diagrams, an engineer conversant with the subject can usually work out a solution which will go far toward eliminating the trouble, and make possible its ultimate total removal, as far as this is economically possible, at a minimum expense. Unfortunately experience has shown that the man trained entirely in telephone work seldom has even sufficient knowledge of this special class of work to prepare a report of the actual conditions bearing upon the inductive interferences which will give the engineer consulted enough information to enable him to prepare a working plan for minimizing the disturbance. In the absence of such a report, the engineer is obliged to personally make a detailed inspection of the plant and collect data. This usually makes the cost of his services seem prohibitive.

We believe that few plants are without a man competent to prepare a report completely and accurately enough to enable a competent engineer to solve any problem of inductive disturbance likely to arise. The purpose of Mr. Fowle's article, appearing on another page, is to tell in a general way what to look for, and what to include in such a report. We commend it as worthy of the careful reading of managers, wire chiefs, and construction men, in any exchange exposed or likely to be exposed to troublesome inductive troubles. It would be well to preserve it for future reference.

That the subject is a perpetually live one is shown by frequent applications to our query department, invariably exhibiting deficiencies which make it impossible to give satisfactory advice.

If sufficient interest is shown in the present article, by expressions of opinion in letters to the editors, it may be followed by a carefully prepared sample report, covering a set of conditions fairly typical of not uncommon experience, which will serve as a further guide to the economical banishment of such troubles.

Calling the Turn.

True to form, the *Pacific Telephone Magazine*, the little monthly printed by the Pacific Bell for free distribution among its employes, has launched the now famous "Sinsel letter," relating to the alleged failure of the Idaho Independent, at Boise. This works out TELEPHONY'S forecast in the matter to the hair's breadth. It is only one more example of how easy it is to foretell what that unusually intelligent body, the Bell Press Bureau, will do under given circumstances. Now we may expect to see this item clipped and reproduced (for pay) in the daily press.

Under the caption, "An Old Story Retold," this impartial little bulletin leads briskly off as follows: "The old story of fair promises and no performance that has characterized Independent telephone projects has been again told in the sale of the Utah Independent Telephone Co. at auction in Salt Lake City. The situation is conclusively shown in the following letter addressed by the secretary and manager of the company to its stockholders."

This is particularly entertaining in view of the fact that the letter, which was signed with Mr. Sinsel's name, and which grossly misrepresented the situation of the company, has been shown to have been written by attorneys for the Bell interests with a definite view to publication in just this form later. Mr. Sinsel has repudiated the whole thing, has declared it a mass of lies, and has stated that he knew absolutely nothing of it until the letter appeared in the local papers.

When the letter was first discussed by TELEPHONY, in its issue of July 22, we said: "If this statement had been dictated by an official of the Rocky Mountain Bell, for publicity use in the future, as it more than likely was, it could not have been better suited to their purposes. Nor could it have been farther from the truth." What a shabby and pitiful little game! It does not require much to "conclusively show" the bright young men of the Press Bureau, but it takes a trifle more to convince the public.

Operating.

Success in the telephone business, as in others, does not always go with the best equipment. There are many cases on record where a company with magneto equipment, and a first class organization, has won out in competition with a common battery exchange handled by people who were content to attain a fair average in their work, and stop there.

The way to make money in the telephone business is to supply the public the best service that can be produced. And that means good operating.

James A. Winfield has put the Nova Scotia Telephone Co. in the ranks of prosperous and progressive telephone business. In the last number of the company's *Bulletin* he refers to a not uncommon feeling that a telephone company's business consists largely of building a fine outside plant, putting in good switchboards and long distance telephones, keeping them up in fairly good shape and getting the money.

This impression, says Mr. Winfield, is absolutely wrong. A plant such as above described is merely a steam engine without the steam, which you will realize is of very little value. All the above items are more or less necessary, but in order to enable us to give a satisfactory service, we must have the steam, which is the OPERATING. It is possible to give good service with an inferior plant by means of A1 OPERATING, but it is absolutely impossible to give good service, no matter how good the plant, with INFERIOR OPERATING.

THE SUNKEN ROAD

"That combine (American Telephone & Telegraph Co. and Western Union Telegraph Co.) is approaching its Waterloo in its finances."—Letter from J. C. Adams, Vice-President Postal Telegraph-Cable Co., to J. P. Lightfoot, Attorney General of Texas.

Springfield, Ill., Evening News Scores Service Given by Central Union Bell Co.

The Springfield (Ill.) *Evening News* recently summarized the telephone troubles of that city in an editorial which took the Central Union Bell to task severely. The editorial was, in part, as follows:

The indifferent service rendered by the Central Union Telephone Co., of this city, is a matter of general comment and much complaint.

Interminable waits in getting "connections," apparently deaf operators who fail to get the number called for a confusion of numbers resulting in delay and irritation at both ends of the line, and mechanical faults causing indistinct communication over the wires, are a few of the local complaints.

Long distance service is even more unsatisfactory. It takes courage and patience to undertake a conversation by telephone with a party living at a distance. When communication is finally opened with the long distance operator, which in itself is frequently achieved with difficulty, it is too often the case that the line is "busy," and although long distance conversations seldom exceed five minutes in length, it is an exceedingly discouraging task to await the release of a line.

And when, after a most aggravating delay one finally gets in touch with the party sought, it is too often the case that conversation is impossible because of indistinctness.

This criticism of the operation of the local Central Union Telephone Co. applies only to the character of the telephone service it renders to the public. Its system of collecting in advance and in chopping off the service and reinstalling a telephone only after the delinquent subscriber has been penalized by the exaction of an advance payment of three months, is in perfect running order.

A subscriber may sit at the telephone waiting for a connection indefinitely, he may struggle in vain to carry on a conversation over the wire, he may repeat and repeat again to "Central" the number desired, and he may repeatedly answer the telephone only to find that the wrong number has been called, but there is never any delay in the monthly presentation of the bill for this atrocious service, nor can he escape the printed reminder and threat of the penalty that awaits him in case he does not dig up the coin at the time set by the company.

The *News* concludes by calling the attention of the city commissioners to the prevailing conditions. This is good as far as it goes. Very much more effective, however, would be a movement to make every telephone user a patron of the Bell's competitor, the Inter-State. If the press of Springfield really desires to improve the telephone service, let it arouse enthusiasm in a general campaign to increase Independent patronage. Nothing else could possibly be so effective. In this campaign it will be materially aided by the long distance connection with Chicago, which will shortly be at the disposal of the Inter-State's subscribers. There will be no question of satisfactory service for toll business over those lines.

Led as Lambs to the Slaughter.

At a meeting of the stockholders of the Rocky Mountain Bell Telephone Co., the sale of the property to the Mountain States Telephone & Telegraph Co., the newly organized Bell concern which also absorbs the Colorado Bell and the Tri-State, was formally ratified. In the matter of an exchange of stock the Rocky Mountain Bell stockholders accepted three shares of the new company for five of the old, netting them sixty cents on the dollar. It is stated that the meeting was a quiet one.

Wireless Pays Twenty-five Cents on Dollar.

The Radio Telephone Co., a so-called wireless concern, has compromised with its creditors at twenty-five cents on the dollar. The settlement was made in the bankruptcy court in New York City.

Cumberland Bell Shows Increases in Gross for July and Seven Months, but Surplus is Smaller.

The Cumberland (Bell) Telephone & Telegraph Co. has issued its statement of earnings and expenses for the month of July and the seven months ended July 31. In both cases the gross receipts are shown to be increased, while the net surplus, after expenses and fixed charges, are less than for the corresponding periods last year. For July even the net earnings fell away. The figures compare as follows:

REVENUE ACCOUNT.

MONTH OF JULY.

	1911	Increase
Gross earnings	$611,108	$45,553
Operating expenses	368,367	46,734
Net earnings	$242,741	*$1,181
Fixed charges	50,681	1,929
Surplus	$192,060	*$3,110

SEVEN MONTHS ENDED JULY 31.

Gross earnings	$4,206,461	$274,897
Operating expenses	2,496,191	258,565
Net earnings	$1,710,270	$16,332
Fixed charges	357,717	21,382
Surplus	$1,352,553	*$5,050

*Decrease

The statements are give out without information as to this singular condition. It is expected that they will prove interesting reading to the minority stockholders.

Wireless Officials Start for Prison.

The United States Circuit Court having decided against the appeals of officials of the United Wireless Telegraph Co., they have begun serving their sentences. Those sentenced to the federal prison at Atlanta, with their terms, are: Christopher Columbus Wilson, president of the company, three years; George W. Parker, two years; F. X. Butler, two years; W. W. Tompkins, one year. W. A. Diboll was sentenced to serve one year in the New York County penitentiary. Vice-president Bogart changed his plea to guilty, aided the prosecution materially and was let off with a fine.

Keystone Report for July.

The Keystone (Independent) Telephone Co., of Philadelphia, has issued its regular monthly report of earnings and expenses for the month of July. The figures follow.

REVENUE ACCOUNT.

MONTH OF JULY.

	1911	1910
Gross earnings	$96,106	$94,472
Operating expenses and taxes	49,062	47,422
Net earnings	47,044	47,050
Less interest charges	24,392	24,611
Surplus	22,652	22,439

Would Limit Rates in Salt Lake City.

A dispatch from Salt Lake City states that an ordinance has been introduced in the council there providing that no charge for business service shall be made to exceed $78 a year, and that $30 a year shall be the maximum charge for residence service. The penalty provided is a fine of not more than $299, or imprisonment for six months, or both. The measure is aimed to forestall the Mountain States Bell, which recently took over the Rocky Mountain Bell and also the Utah "Independent."

Some Remarkable Facts as to Bell Telephone Finances

Surplus and Reserve Shown to be Largely Composed of Profits from Convertible Bonds Exchanged for Stock, and Not of Cash from Earnings—How Subsidiaries' Bond Issues Impair Value of A. T. & T. Stock—No Recognized Expert Accountants Employed

In a balance sheet of June 30, 1911, filed with the New York Stock Exchange, the American Bell Telephone & Telegraph Co. claimed a "surplus" of $56,190,783, and a "depreciation reserve" of $38,505,014. The shareholders of the Bell company and the public no doubt assumed that this "surplus" and "reserve" were created out of profits annually earned over and above dividends paid by the telephone company. The actual fact is that some $32,104,886, or over one-third of the whole, is represented by *capital cash* received from its own bondholders, who converted their bonds into Bell stock.

Furthermore, if over one-third of the whole surplus and reserve is automatically built up from a single capital or convertible bond transaction, as hereinafter shown, it is reasonable to inquire what part of the remaining two-thirds has been created by stock, loan and other transactions between the Bell company and its subsidiary corporations.

As to the convertible bond transaction. The Bell company in 1907 and 1908 issued bonds to the amount of $150,000,000. These bonds are what is known as convertible bonds; that is to say, the holder can convert them into stock. The telephone company's balance sheet was properly charged with a liability of $150,000,000 when these bonds were issued. Subsequently, when a holder of the convertible bonds presented them for exchange for Bell stock he got approximately only $1,000 of stock for $1,337 of bonds, that being the ratio of exchange.

Thus, the moment the bondholder gave up his $1,337 of bonds and the company gave him back only $1,000 of stock the liability of the company to the same individual to the extent of $337 was automatically wiped out and the surplus and reserve correspondingly increased. The holder, however, gets 8 per cent. dividend on the stock, while before he got 4 per cent. interest on the bonds.

This balance sheet, filed with the New York Stock Exchange, further shows that on June 30, 1911, the outstanding convertible bonds aggregated $22,734,000. In other words, out of the $150,000,000 of convertible bonds originally issued about $127,266,000 were turned into stock, and, through the process of conversion above described, the capital liability of the telephone company was decreased by about $32,104,886, and the surplus and reserve automatically increased by that amount.

As against this, as stated above, the telephone company will pay 8 per cent. on the stock, while it previously paid only 4 per cent on the bonds. That is, where before it must pay the security holder about $53 out of earnings, it must now pay $80, constituting an increasing burden which must be met out of earnings.

The fact which should be clearly understood is that, of the total of $56,190, 783 of "surplus" and $38,550,014 of "reserve," claimed by the Bell company, more than one-third was received from this *capital cash* paid by the shareholders and *not from surplus profits gained from the business.*

One concrete example may be seen in the 1909 annual report of the Bell company. For that year the telephone company claimed that, after making all payments, including the 8 per cent. dividend on its stock, the remaining profits were $6,059,112.88. Yet, on another page in the same annual report the surplus and reserve are shown to have increased $42,270,530.16 for that single year, as compared with the 1908 report. Where did this enormous difference come from?

The *Boston News Bureau,* a recognized medium of publicity for the Bell company, in its issue of August 10, 1911, printed a long article headed, "Some Large Surplus Accounts." The following is quoted from that article, the italics being ours:

> With many American corporations the policy of *turning earnings back into property* has been the means of amassing enormous surpluses, which in more than one instance exceed the selling value of the common stock.

In the list of companies at the end of the article the following is given:

	Stock.	Surplus.	Price Stock.	Sur. equal Approx. per Share.
Am. Tel. & Tel.	$263,335.600	$52,109,671	135⅛	$19

In other words, an investor reading the article would at once be misled into assuming that the $52,109,671 surplus represents *earnings turned back into property.* This is obviously not the case to the extent of many millions of dollars.

Another significant feature of Bell Telephone financing, which has not been given proper consideration generally, is the frequent issue of bonds by its subsidiary companies. When the New York Telephone Co. issued $49,492,000 of bonds; when the Pacific Telephone & Telegraph Co. issued $26,798,000 of bonds; when it again recently issued more bonds to the amount of $2,000,000; when the Southern Bell recently filed a $50,000,000 mortgage and announced the immediate issue of $10,000,000 of bonds; and when other Bell subsidiary companies, from time to time, take similar action, very few investors stop to realize that these bonds become a prior lien. The fact is lost sight of that they take precedence over the parent company's own capital stock, over its own convertible bonds and over its own collateral trust bonds, to the extent that the parent company's capitalization is based on the stock of the subsidiary companies, which is admittedly the chief basis of the parent company's own stock and bonds.

Within the last two or three years the subsidiary companies have issued or have announced the issue of $108,000,000 of their own bonds, which, to the extent mentioned above, are a lien prior to all the securities issued by the parent company held by the public. The parent company, notwithstanding its own bonded debt was over $95,000,000, has itself sold in the last six months $12,300,000 more of its own bonds, and is now asking its shareholders to buy $55,000,000 more stock.

Finally, one of the most remarkable of all the freaks of A. T. & T. finance is the astounding fact that the accounts of the American Telephone & Telegraph Co. are not audited by regular chartered auditors of accounts, as is the case with all well regulated corporations.

Michigan Telephone Traffic Association Elects Officers for Ensuing Year.

At the annual meeting of the Michigan Independent Telephone & Traffic Association, held at Grand Rapids recently, the following officers were elected: President, C. E. Tarte, Grand Rapids; vice-president, W. J. Melchers, Alma; and secretary and treasurer, W. S. Vivian, Grand Rapids.

Newly elected members of the board of directors are: J. V. Moran, Kalkaska, succeeding S. W. Swaverley; Charles Cohn, Detroit, succeeding S. C. Barr; W. J. Melchers, W. A. Jackson, Frank M. Howard, R. C. Smith, J. E. Hisey, J. P. Gibbes, E. B. Fisher, L. L. Cohn, A. C. Himebaugh, W. S. Vivian, Thomas Bromley, jr., and M. A. Briggs.

It is reported that during the past year the association has handled nearly 500,000 messages; about 65 per cent. more business over previous years.

Bell Company Dodges Interconnection Issue in Kansas by Compromising Case Without Commission.

The Missouri & Kansas (Bell) Telephone Co. is preparing to avoid the interconnection issue in Kansas. Some time ago, as reported by TELEPHONY, the Girard Mutual (Independent) Telephone Co. came before the Public Utilities Commission with a complaint that it had applied to the Bell company for connection with its long distance lines, and had been refused. The commission decided to make this a test of its rights under the public utilities law to enforce such a connection. To this end it had prepared its case carefully and was ready to go into the courts if its decision was appealed from.

However, soon after the matter was laid before the commission, the Bell interests apparently concluded to fight shy of establishing a precedent which might become inconvenient. It, therefore, opened up negotiations with the Girard company, offering connection with that concern and agreeing to give it 12½ per cent. of the business originated by it. The mutual company having 700 subscribers, believed itself entitled to more and demanded 25 per cent. The matter is now understood to be in process of adjustment between the two companies and, it is thought, will be settled before the case is called by the commission this month.

Tiring of Monopoly After Sale of Independent Company, Hutchinson Plans for Competition Again.

The telephone service in Hutchinson, Kans., having been unbearable practically ever since the sale of the former B. & B. Independent company to the Bell, a number of the prominent business men of the city are quietly arranging to organize another Independent company. An application will shortly be made to the City Council for a franchise, after which the work of building a new modern system will be speedily undertaken.

"We are not quite ready for publicity in the matter," said one of the promoters recently, "but the company is to be a local one, which shall give the citizens of Hutchinson adequate telephone service at reasonable rates."

It is also understood that arrangements have been completed which will afford satisfactory toll service with Independent companies in adjoining cities. The Postal, which has lines direct to Kansas City, may also enter into the deal. In short, competitive service, which has been demonstrated to offer the only satisfactory solution of the telephone problem, will be again given in Hutchinson, and the Bell company will find itself in precisely the situation it occupied before buying out the B. & B. plant, except that the new competitor will be stronger and better equipped in every way.

Aberdeen, Wash., Banker Declares Bell and Western Union Two Most Mercenary Trusts.

Declaring that the service rendered Aberdeen patrons by the Pacific (Bell) Telephone & Telegraph Co. is totally inadequate and that the company is operated exclusively in the interests of stockholders and not for the benefit of the public, W. J. Patterson, banker, condemned the company in a statement before the City Council recently, and urged the council to order an investigation.

In accordance with the statement and the request, a committee consisting of Councilmen Newell, McCaw and O'Hare was named to take up the matter with the officials of the company.

"Two of the most mercenary of all trusts," declared Mr. Patterson in his statement to the council, "are the Bell telephone company and the Western Union Telegraph Co.

"In an endeavor to explain the cause of the poor telephone service in Aberdeen the local manager of the company has told me that he cannot get enough girl operators. He fails to say, however, that the reason is the fact that the company will not pay its girls a living wage."

Solitaire.

Passengers said that Mr. Morgan played solitaire almost continuously on the return trip from Europe.—*News Item.*

He sits apart and plays alone
A simple, baffling game,
And none but he can reach success
Or misadventure name.

The eyes that level looked at thrones
With equal monarch mien
Turn now their gaze of sombre fire
On painted king and queen.

Symbol and type each figured card,
In game he's playing there,—
His life and toil and fame have been
A game of solitaire.

True, fate the pack to him did hand,—
But vain had been the deal
Sans crystal brain and soul of flame
And will and hand of steel.

That, calm through fair or frowning chance,
Picked, spurned, arranged, designed,
And patiently and boldly e'er
Upbuilded and combined;

And played as no one played before
With none the quest to share,—
And yet a whole world watched when he
Was playing solitaire!

—*Boston News Bureau.*

A. T. & T. Stock Still Declining.

A. T. & T. was quoted on the Boston Stock Exchange this week at 132 bid, showing a still further decline from last week.

Independent Lines Opening All Northern California

Sierra Construction Co., Building Independent Plants Throughout Sacramento Valley, Contracts with Postal Telegraph to Use Lines Reaching Oakland—Connection with Bay Cities Home, of San Francisco, Sure to Follow—Vast Territory Being Covered

An agreement has just been entered into between the Postal Telegraph-Cable Co. and the Sierra Construction Co. which will, within a comparatively short time, place a large and prosperous territory in northern California in direct connection with the system of the Bay Cities Home (Independent) Telephone Co., at San Francisco, Oakland and adjoining cities and towns.

The Sierra Construction Co. has been, and is still, actively engaged in building Independent telephone plants throughout the Sacramento Valley, at present extending as far north as Shasta county, some 200 miles north of San Francisco, although plans are perfected to reach much further. In pursuance of its purpose to link these companies together, and to ultimately connect them with the Bay Cities Home system, the Construction company has contracted with the Postal for space on its poles between the following points: Redding and Red Bluff; Red Bluff and Willows; Willows and Oakland; and Davis and Sacramento, in all a total of about 250 miles.

It is understood, further, that the company will enter the city of Sacramento, in which at present the Pacific Bell operates without opposition, and will there establish an Independent plant. While this has not been officially given out as yet, it is obviously contemplated, as the long distance lines leading into Sacramento would be comparatively valueless without that terminal.

Officials of the Bay Cities company state that they have not as yet been called upon to consider the question of connection with these lines, but there can be no doubt whatever that an arrangement will later be perfected which will open up the vast territory of the Sacramento Valley to San Francisco Independent subscribers, and which will permit this entire territory to reach the cities at the Golden Gate.

In their efforts to cover this field, the Independents have met with every defense which a rich and powerful corporation, the Pacific Bell, could bring to bear. City councils and county boards of supervisors alike have felt this influence and have opposed the advance of the competitive interests. Thus far, however, the only permanent effect has been to stimulate public enthusiasm in the movement. It is stated on good authority that, in Glenn county alone, upwards of $100,000 was expended in various ways to defeat the Independent operators, without effect other than to advertise and increase the Independent subscription list.

The Independents made their first stand in Colusa county. There they made the mistake of tying up for long distance service to the Bell. A. S. Lindstrom and W. H. Travers, representing the Sierra Construction Co., accepted the Bell company's advances and entered into the agreement. Efforts are now being made to break the contract as constituting a violation of the anti-trust laws.

Approximately 1,000 telephones are connected with the system of the Colusa County Telephone Co., of which A. W. McKay is manager. Dean equipment is used, a three-position board being located at Colusa, one-position boards at Maxwell, Williams, Grimes and Arbuckle, and a combination local and toll board at Princeton.

The Glenn county Independents refused to connect with the Bell lines when they began operations and the Pacific people proceeded to conduct an active campaign against them. Many solicitors were placed in the field and every possible influence brought to bear to hamper the growth of the new company. Yet the Glenn County Telephone Co. today has four exchanges, with toll lines throughout the county, and ample connections with Tehama county adjoining. There is a three-position board at Willows and one-position boards at Butte City, Germantown and Orland. A sixty-five mile long distance line connects with the East Park Dam. Since the advent of the Independent company the Bell has replaced its magneto equipment with common battery, yet it is losing subscribers to the newer company almost daily. E. N. Clover, formerly with the Pacific Bell, is in charge of the new construction, which is steadily going on.

The Tehama County Telephone Co. is now one year old. It has 200 telephones in Red Bluff and is installing instruments as fast as it is possible to do so. The peculiar franchise laws of the county were invoked here to keep the Independents out, but the latter outgeneraled their opponents and won. At this time the Red Bluff lines are the only ones completed, but extensions are now under way to all parts of the county, and a large subscription list is assured. C. T. Dodge is at the head of the Tehama company and is making the enterprise a success through sheer personality and fair dealing. Red Bluff has a three-position board; a two-position board is now being installed at Corning, twenty-two miles distant.

Independent companies are also being planned for Shasta, Siskiu, Trinity and other northern counties, and it will not be long before practically all of northern California will be built up by the Independents. This done and direct communication had with San Francisco, through the medium of the Postal lines and those of the companies themselves, Independent telephony will have made a tremendous stride on the Pacific Coast.

W. H. Travers, formerly with the Bell in Texas, is at the head of the construction work now going on. The construction which the Sierra company is now engaged in is modern to the minute. The towns are being built with all cable systems and the equipment is, in every respect, the best that can be had.

Illinois Committee Visits New York Commission.

The public utilities committee of the Illinois Legislature, which is investigating the desirability of establishing a commission in that state, recently spent some time looking into the operation of the Public Service Commission, Second District, of New York state. This followed a similar excursion to Wisconsin, where the procedure of the Railroad Commission was considered. It is believed that the committee will recommend legislation to bring about the creation of a similar body in Illinois.

Cumberland Ordered Out of Kentucky Town.

The Cumberland (Bell) Telephone & Telegraph Co. has been ordered out of Calhoun, Ky., by the municipal authorities, the evacuation to proceed within ninety days' time whether another exchange can be established in that city within that time or not. The Cumberland company, accordingly, has made arrangements to withdraw from Calhoun by September 10. This action was the result of the Cumberland company's peremptory refusal to pay an occupation tax to the city.

As to Panics

The Trouble with New York—Labor Picked as the Scrapegoat—"Universalism" a Menace to Bell

By J. C. Kelsey

The United States of America covers a great deal of ground. And it encounters a great variation of climate.

Accordingly, our product is so diversified as to keep us busy and happy almost all of the time.

If corn fails in Oklahoma and Kansas, we are cheered by the bountiful crops of cotton in Texas and Mississippi.

Somewhere the sun is still shining and the birds are singing.

But just as when the mighty Casey struck out, the city of New York is in deep gloom.

New York has been a favorite son. It has had all the government favors.

When the panic of 1907 struck all of us, and we were compelled to work off clearing-house certificates on the reluctant landlady, New York was receiving millions of dollars from our government.

Atlanta, Kansas City, Memphis, Minneapolis, St. Louis and Chicago did not get a dollar. So they had to sit tight and wait for the money kings to do something.

Instead of kings, I think they should be called "money babies." They cry as loud as any baby and they are just as unreasonable.

Living on their nerve, they are naturally hysterical, and as liable to take the bit in their teeth and run amuck as any fool horse you ever knew.

Boersianer, the financial writer for the Hearst papers, says that if the fear of New York financiers is sincere, it indicates something quite alarming.

It betrays cowardice, a loss of discipline, surrender of moral restraint!

That's a pretty tough accusation for gentlemen who handle the money of widows and orphans.

Carlyle, the great analyst, in speaking of a financier of his day said, that the man had "cunning in a supreme degree, but intellect next to none—cunning, coupled with an esurient character, the natural consequences of a defective intellect—the vehement exercise of a short, poor vision that saw only money."

I do not place much value on over-intellect, because of its poverty-stricken tendencies, yet it describes New York.

These people only see and know their own city—and the financial district at that.

This constant preoccupation has produced insanity, and this explains the utter demoralization in New York.

The real trouble in New York is a sort of rascality induced by insanity, fear or cowardice.

When a man buys a stock on a margin, of course he is a fool primarily.

Secondarily, the commission men who sell these stocks, reserve the right to unload them without the knowledge of the customers.

In other words, New York dealers have bucket-shopped their trades.

Just recently, a broker was fired from the exchange because he took all the good trades to himself and the customers only got orders filled which happened to be bad.

This sounds like a jest upon the saying that "Wall Street is as straight as a string."

But Wall Street is only straight legally—not morally.

Think of it!

The selling in New York has been done by brokers without permission of customers.

Nice, isn't it?

Did you ever notice in your growing boyhood who wore whiskers and looked sternly into the eyes of the world?

The doctor, the undertaker and the cashier of your bank.

Again Boersianer says: "The fundamental requisite of a bank cashier is composure. In times of storm, a bank officer must maintain a calm countenance and a serene deportment."

But this rule has been broken.

The captain should be the last man to leave the ship. Instead, we have a picture of the captains jumping into the life boats first, and directing the ship's panic from that place of safety.

It is really strange that the great American City of Four-Flushers should be so frightened. It looks more like a bluff—to scare the Taft-Wickersham combination—to defeat the Sherman Act—to stop government prosecution of wrong-doers.

That is where the mistake will be made.

An honest man never questions an inquiry into his credit.

The very reason that the government is taking a hand is that the game is crooked.

It is "heads I win, tails you lose."

It is a loss of confidence.

It is the wail of the workingman. With his income, he couldn't breast the tide of high living cost. They are taking his money and giving him adulterated food and clothing.

He has nothing left to invest.

New York has nothing to do with prosperity. It costs them too much to live.

But the foolish people do not know it. They are short of money and champagne is running low.

Something is wrong.

Stop, thief!

Ah, they have it! It is labor! Labor must be liquidated. That is the Jonah to go overboard.

With the usual short-sightedness of great financiers, they begin to economize at the wrong end, like a western railroad which economized by discharging the track or section men, and added a new road boss.

Railroads are trying to economize on labor and that means labor trouble, with the misery of strikes which always fall upon women and children.

The place to economize is in New York!

It's no fun to be a railroad man. He is constantly hound-

ed by the Street to make more money, so that more stock can be issued and men made richer in New York.

It is an endless chain of misery from start to finish.

It is amusing to read the reasons and remedies for these hysterical times.

Banker Reynolds says that publicity will restore confidence, that "people can be trusted to be fair, and by letting the farmer, plainsman and city dweller know what is being done, public opinion will be formed properly."

That is it!

That is what Vail wants. He wants to mould public opinion to the regulation he desires. In other words, this venerable philanthropist wants his own way.

The only hope for the Bell is a monopoly to enable it to get its money back.

Banker Reynolds knows that publicity will help, but the public will not stand for "bunk" publicity.

No corporation will ever lay facts before the public. By facts, I mean the details of its business.

I fail to see how anything is going to help until the small investor becomes satisfied that he will not be stung.

Nothing will help public confidence more than some law to give relief to outraged minority stockholders.

Any irresponsible crowd can get control of a property and ruin it.

What a joke it is that the Equitable Life Insurance Co. should have a capital stock of $100,000 and the person controlling 51 per cent. of that amount, should control $500,000,000 worth of assets and liabilities!

It is the easy manner in which properties are acquired that disturbs stockholders.

Look at the Bell licensee properties. The Bell parent practically secured them for nothing. And you may be sure that when it got control, the dividends ceased.

How the Bell gets away with the game is a mystery. But it is at last found out, or is under suspicion.

That $50,000,000 Bell issue is still undigested.

It was called a melon, too. Really it's a lemon. Given at par when the original stock stood around 140.

Most people laugh when anyone claims that Bell Telephone is in a dangerous position. But it is, just the same.

Wedded to a silly propaganda called "Universalism," bent upon monopoly, it is coldly waiting for a chance to wring the public neck.

I won't feel sorry for the public. It will probably deserve all it gets.

Ohio will be the first state to prove that telephone competition is a permanent thing. Wait patiently.

The public utilities bill looks like a good thing today, but it will be repealed in a hurry.

The Bell company has learned absolutely nothing. Some of its employes have.

But, beginning with the great (?) Chief of Wires, down through the official staff, there has been no change. They still believe in the heresy (?) of telephone competition.

In spite of bad business, prospective railroad strikes, failures and panics, this one foolish concern fights on for a silly and impossible thing.

I know of one town where the Bell has bought out four plants, at good prices each time. And there will be more, too.

The public memory is very short and as long as the great Bell suckers pay such good prices for alleged junk, monopoly will have many a hard bump before it gets to the Mount of Universalism.

Universalism is a pet theory of an old man.

It is an idea—the child of a cunning brain—"cunning to a supreme degree, but intellect next to none."

"The vehement exercise of a short, poor vision that sees only telephone monopoly."

Vail or his successor can not sit tight. They have to move to a certain goal, or they will be ruined.

He has too many properties earning from $25 to $35 per station year.

But "Big Business" protects it.

Bell has never yet submitted its books to real certified accountants. It selects its own, you may be sure.

The country is not fooled by the financial hysteria. But it is fooled by the cry from predatory concerns that they are seeking publicity.

That is a joke.

Real Bell publicity would make a smell rise to high heaven, and make even the angels hold their noses, if some great inquisistion would put Bell on the judgment seat.

The Augean stables were never cluttered with such filth.

Times may be good—times may be bad—one great corporation goes on serenely to its death.

It goes serene in the hope of monopoly—content in the hope of death for all competitors—and getting deeper into the mire daily.

Local control of telephone service will never bow to universal control.

On that platform, the great modern goose, the Bell Telephone concern, is going to its ruin!

MORAL:—Panics even are local issues.

Pennsylvania Installs Concrete Pole Line.

The Pennsylvania Railroad has built a line of reinforced concrete poles across a five-mile stretch of swampy meadows between the Manhattan Transfer and the portal of the tunnels leading under the North River to its new station in New York City. Over 200 poles were required and these were set in concrete bases. On account of numerous railway and highway crossings the spans vary from 70 to 135 ft., the average being 120 ft. The poles are from 35 to 65 ft. in length and rise from 25 to 50 ft. above the ground line.

Wisconsin Company Issues Bonds.

The Peoples Telephone Co., of Superior, Wis., has filed with the city clerk a record of a mortgage for $100,000, in favor of the Minnesota Loan & Trust Co., of Minneapolis. The proceeds of the bonds which will issue against it are to be used for extending and bettering the system. The bonds will bear interest at the rate of 5 per cent.

Postal Secures Right-of-Way in Georgia.

The Postal Telegraph-Cable Co. has been granted, by a special board of assessors, a perpetual right-of-way along the track of the Georgia Railroad from Camack to Macon, Ga. The Postal has a line to Atlanta over the main line of the Georgia road, but has hitherto leased its way over the shorter span.

As to the Disposition of Old Telephone Directories—Mr. Coffey Offers Sound Suggestions.

In response to our editorial August 19 regarding the use of old telephone directories, TELEPHONY has received the following letter from John W. Coffey, general manager of the Independent Toll Clearing Co., with offices at Springfield, Ill.:

I heartily endorse the plan set forth in your editorial, relative to the disposition of old telephone directories. On account of my connection with the toll line work during the last ten years I have had occasion to see the need of toll line advertising throughout the Independent field more especially in the smaller towns. It is more a matter of educating the people to the fact that the Independents have long distance toll lines rather than advertising long distance toll lines, since it is generally known throughout all towns and villages that it is possible to reach almost any point by telephone connection.

But, from some unknown reason, a large percentage of the people are under the impression that an Independent telephone company is purely a local exchange and that it is necessary to go to a Bell exchange or pay station in order to communicate with a party in a neighboring town or city.

In visting a town I have made it a point for several years to inquire of one of the natives, usually a business man, the location of the telephone exchange. Invariably I am asked whether I want local or long distance service. If I say the latter, I am given the direction to the Bell company's office or pay station. I then always make it a point to explain that the local company has certain long distance connections and frequently go into the party's place of business and call up some wholesale house upon the lines of the Independents, which he is in the habit of calling over the Bell lines, and prove to him the usually superior service of the Home company.

Therefore, I consider the plan a splendid medium of education, and since the changes made in the directory from year to year affect the business district so little, the old books in the hands of the smaller town business men will answer the purpose just as well as a new issue, and at the same time will naturally be very much appreciated by them.

I rather think the telephone companies can make the distribution to a much better advantage than any commercial body, since the latter, if disposed to assist the Independents, are not familiar with the necessary information that should go with the delivery of the directory in each town. By sending them direct to the local manager, he in turn can make the distribution personally and at the same time explain the number of circuits, advantages, etc., to be gained by using the Independents' toll lines.

The city and country business men, together with both telephone exchanges, will all undoubtedly profit by the little effort necessary and with practically no outlay.

We hope that others who have ideas on this subject which will aid in throwing light on what appears to be a matter of more than passing interest.

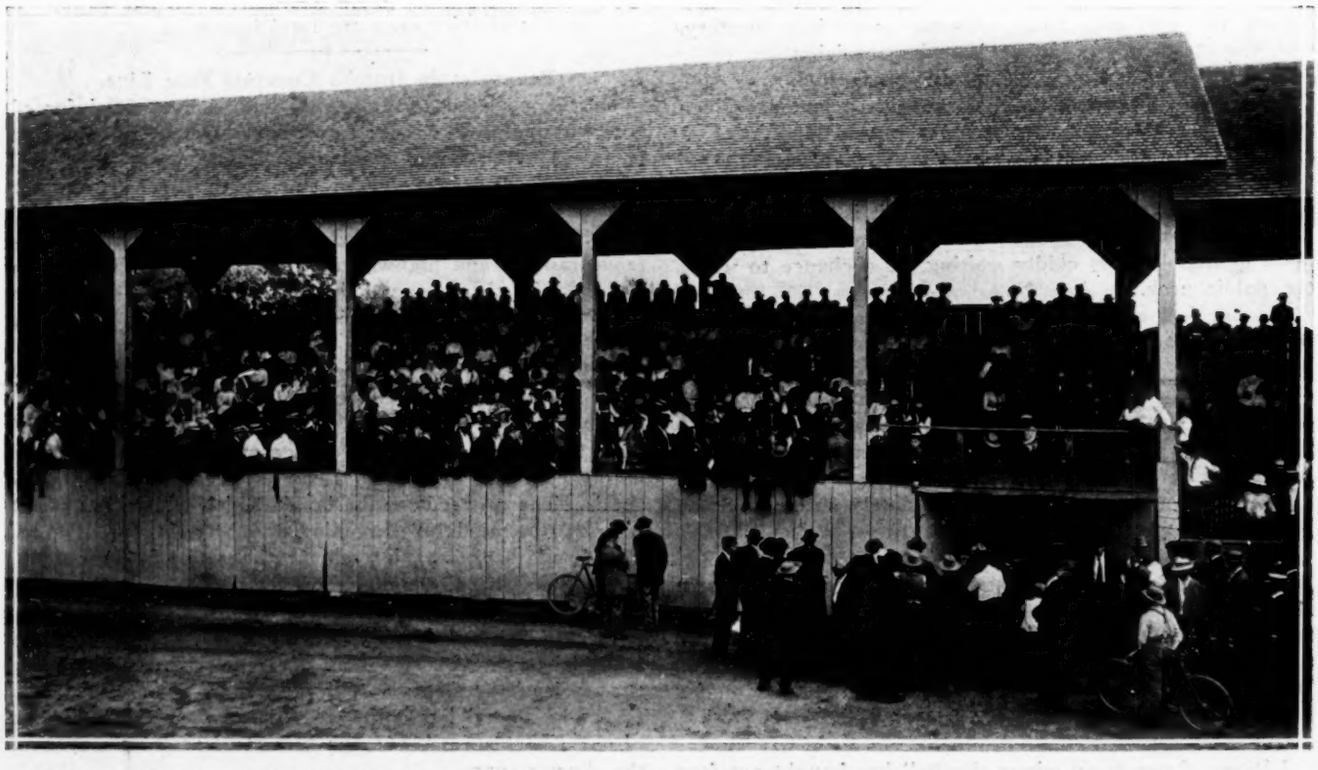
Ohio Rural Company Holds Rousing Meeting in Which Five Thousand Farmers Participate.

The photograph reproduced below was taken at a meeting of the subscribers and stockholders of the Farmers Independent Telephone Co., of Sidney, Ohio. Fully 5,000 were in attendance, practically all being farmers living in and around Sidney.

There has been a great deal of activity in the affairs of the Farmers company during the past few months and, for the purpose of still further stimulating interest in the company as well as for a general discussion of telephone matters, it was decided to hold a picnic. The place selected was the fair grounds, near Sidney, and that it was a complete success is partly indicated by the number in attendance. In the picture, Fred Seeley, traveling representative of the Swedish-American Telephone Co., of Chicago, is seen addressing the meeting.

The Farmers company was organized about a year ago. It has a common battery plant in Sidney and between 500 and 600 telephones installed. The equipment is all manufactured by the Swedish-American company.

A REVELATION doesn't amount to shucks if it is not given out to other people. Neither is news of any account unless it is published. We are not so keen for revelations, but we certainly want the news concerning any happening in the telephone field.



Portion of the Five Thousand Farmers Who Attended a Meeting of the Farmers' Independent Company, at Sidney, Ohio.

Making Field Reports on Inductive Interferences

This Article Meets a Practical Demand Shown by the Character of Many Requests Upon Telephony's Query Department—It Tells What the Construction or Maintenance Man Shold Learn Before Seeking Assistance on a Severe Power Induction Trouble

By Frank F. Fowle

It rarely happens that a report on inductive interferences or disturbances in telephone lines, due to parallel exposure to alternating current power circuits, contains sufficient information. Such problems almost always involve complex technical questions, and it is perhaps only natural that the average telephone manager fails to comprehend the necessity of giving the elaborate data needed. In many cases the preparation of a report is left to the lineman, whose knowledge of alternating current practice is usually meagre. Therefore it seems that general instructions to be followed in such cases should be of considerable help to telephone managers and their subordinates.

At the outset it is well to emphasize the fact that the field inspector, whoever he may be, should possess sufficient knowledge of power and lighting systems to enable him to prepare a correct and comprehensive report. If no single individual possesses the necessary qualifications the inspection and report should be made jointly by two (or more) employes, one representing the telephone company and one the power company.

Inductive interferences as a whole are capable of resolution, under theoretical analysis, into two components, one of which is termed electrostatic and the other electromagnetic. The former is caused by the electrostatic field which exists around any energized conductor; the field intensity is proportional in every case to the potential of the circuit, that is, doubling the potential will double the field intensity. Any system of connected conductors which lies within the field will exhibit induced charges and if the disturbing field is alternating (periodically) the backward and forward flow of these charges will set up an alternating induced current. The electromagnetic component is caused by the magnetic field which is set up around any conductor traversed by a current. Any parallel conductor which lies within the field will exhibit an induced e. m. f. whenever the inducing field changes in intensity; and if the latter alternates periodically, the induced e. m. f. will be alternating, at the same periodicity or frequency.

Hence it is essential to know first the character of the disturbing or inducing circuit, as to voltage, current and periodicity. This applies not only to conditions at some particular time, but throughout any 24-hour period. In stating these facts it is very essential to give the particular kind of alternating current system or transmission employed and a diagram of the connections of the system is very desirable. A brief description of the systems commonly used will be given a little later.

The intensity of disturbance is affected, however, not alone by the conditions in the disturbing system, but also by the electrostatic and electromagnetic field intensities at the telephone circuit, or circuits. These intensities and the resulting induced e. m. f.'s and currents in the telephone system cannot be determined until the distance between the parallel systems is given, in detail, with respect to all the wires of each system.

In practice a pole diagram of each system, showing the distance between them, with all dimensions given in detail, ordinarily meets the requirements. It is necessary to know, further, the length of parallel exposure, in feet or miles. The last information is readily prepared in the form of maps. These maps should show not only the length of exposures, in detail, but, as well, the location of branch circuits, transformers and arc lamps; also all transpositions in each system.

Field Inspection.	Power System.	1. Pole diagrams, with all dimensions. 2. Grouping of conductors in circuits. 3. Voltages and phases. 4. Size, material and insulation of conductors. 5. Map of exposed section, with all dimensions. 6. Location of branch circuits, transformers (giving size), arc lamps and transpositions. 7. Ground connections. 8. Connections of polyphase generators and transformers. 9. General layout of power system.
	Telephone System.	1. Same as above. 2. Same as above. 3. Same as (4) above. 4. Same as (5) above, including distance from power line. 5. Location of bridges, loops, drops and transpositions. 6. Central office and subscribers' circuits and equipment. 7. General layout of telephone system.
Electrical Tests and Data.	Power System.	1. Voltages, phases, currents, frequency and power factor. 2. Load data, for 24 hours. 3. Faults or abnormal grounds. 4. Insulation.
	Telephone System.	1. Insulation. 2. Line balance. 3. Listening tests. 4. Measurements of induced e. m. f's or currents.
Preparation of Report.		1. Maps, with descriptions. 2. Pole diagrams, with descriptions. 3. Circuit diagrams, with descriptions. 4. Power system data and tests. 5. Telephone system data and tests. 6. Maintenance conditions. 7. General status of telephone service as affected by interferences.

Outline of Investigation in Inductive Interferences.

The information needed, as outlined up to this point, usually represents the most difficult feature in these re-

ports from the standpoint of a telephone employee. In the desire to obtain it with accuracy, some of the essential data relating only to the telephone system are likely to be overlooked or forgotten. The physical and electrical conditions in the telephone system, even remote from the place of exposure, are quite as necessary and important.

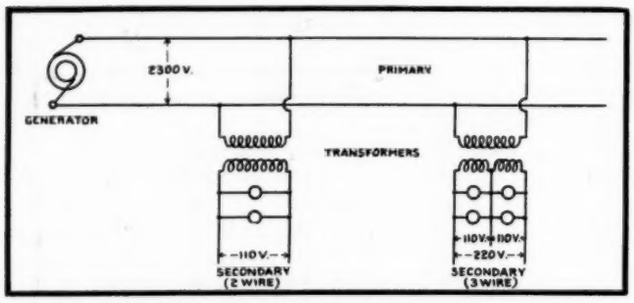


Fig. 1. Single-Phase Primary and Secondary Distribution.

In order to give a comprehensive idea of the full scope of the data needed, a skeleton outline of the proper procedure is given in Table 1.

The procedure here outlined is given in such form that no elaborate explanation should be needed. It is a good general rule, when in doubt as to whether some particular feature is necessary, to include it and thus be on the safe side. A second inspection trip may be saved, sometimes, in this way.

The field inspection is simply a process of registering the facts in regard to the respective plants. It is generally advisable, and often necessary, to extend the inspection of the power system beyond the section of exposure and visit the generating station, and perhaps some of the substations, if any exist. This applies almost regardless of the character of the power system; the latter, of course, may be a distribution system for lighting and motor service in a city or town, or a high-tension transmission, or again a railway system employing high-tension transmission and either direct or alternating current traction.

Almost invariably it is necessary to extend the field inspection of the telephone system beyond the range of exposure. One of the reasons for this, perhaps the most important one, is the need of observing the character of maintenance and particularly the matter of line insulation. The first step in relieving such interferences should always be the improvement of line maintenance and insulation to a high degree of efficiency. Such improvements, where the conditions which prevailed previously were not of the best, have materially reduced the interferences, as a rule.

The circuit conditions in telephone central offices and at subscribers' stations are very often susceptible of improvement, also, and here it is important, again, to have a full description of the plant or its typical elements. The physical inspection should be supplemented by tests to determine the insulation of office equipment, office wiring, outside lines and subscribers' stations, and also to locate any unbalanced conditions. In this way any maintenance defects that are not apparent upon inspection will be found, perhaps, at the same time.

These comments in connection with the skeleton outline of procedure in investigating and reporting upon inductive interferences, should make it comparatively certain that any intelligent telephone employe who is qualified as a plant inspector, will thoroughly cover the required ground from a telephone standpoint.

A word of caution might be added in relation to pole diagrams; it is necessary to have full dimensions, including the distance of all conductors from the centre of the pole or structure, their distances from ground and the distance between the pole centres of the power line and the telephone line. If the poles are not vertical, the angle of inclination from the vertical should be given; or in its place, the height of the pole from the ground line and the distance of the top from a vertical line through the centre of the base.

The pole diagrams of the two systems should be placed on a single drawing, so as to show the separation between them and the difference in ground elevation at the respective pole butts. When the layout or arrangement of circuits on the cross-arms changes, from section to section, new pole diagrams should be prepared to correspond.

In making tests, of any kind on either system it is essential to be specific in describing the results. Omissions in this respect are more to be guarded against than superfluous detail; and this relates not only to the tests themselves and the precise conditions existing at the time, but as well to the testing apparatus and equipment employed in taking observations. A failure to give full details may

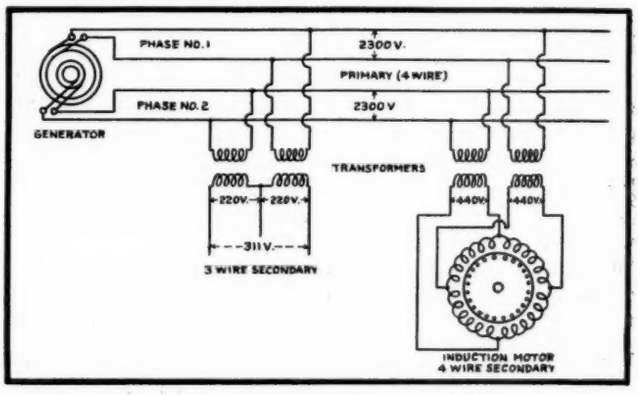


Fig. 2. Two-Phase Distribution System.

result, in some cases, in erroneous assumptions in determining a remedy, or it may leave the question open to some doubt.

The chief difficulty which a telephone manager ordinarily encounters is that of securing an accurate description of the power system, in its essential details. A brief description of the common practices in that class of system will probably be of some assistance. The voltages of power systems vary greatly according to requirements, but there are certain standards for the various classes of service.

			Volts.
Commercial Service	Primary,		2,300
	Secondary	Lighting	110
			220
		Large motors,	440
Traction Service.	City terminals (interurban)		550
	Interurban		3,300
			6,600
	Heavy trunk lines		11,000
Transmission.			6,600
			11,000
			22,000
			33,000
			44,000
			66,000
			88,000
			110,000

There are three divisions of power systems, broadly, from the present standpoint, namely, primary and secondary distribution for commercial service, railway or traction circuits and high-tension transmission.

The classification of voltages according to the standards for these different kinds of service is given on page 276.

This classification does not include series lighting systems which operate on constant current instead of constant potential; the table covers only the voltages of the latter class. The voltage between terminals of series circuits depends upon the number and kind of lamps in the circuit, but does not exceed 9,000 or 10,000 volts, approximately, at the most. In circuits of the latter class the voltage drops in progressive steps, in passing from one terminal over the circuit to the other terminal.

The standard frequencies in use are 60 and 25 cycles per second, the former for lighting or combined lighting and motor service and the latter for traction service; either frequency is employed for transmission, according to circumstances.

Other frequencies have been used and the early lighting systems operated on 133 cycles, in some cases, and on 125 cycles in others. But most of these plants have been rebuilt or newly equipped with modern machinery. A frequency of 15 cycles has been seriously considered for traction service, but is not in use to any extent. A frequency of 25 cycles is sometimes used when motors comprise the greater part of the load; frequency changers can be installed when it is necessary to convert the frequency from one value to another. The higher frequencies give much greater satisfaction for lighting and that fact explains the almost universal use of 60 cycles in commercial distribution systems.

The standard phase systems are single- (one) phase, two-phase and three-phase. The first is the simplest one and is used for commercial lighting service; single-phase motors are served from the same circuits when the power consumption is small. A typical single-phase distribution system appears in Fig. 1.

Two-phase and three-phase systems are both classed as polyphase, and are used for commercial power distribution to motors of considerable size. The two-phase system is not frequently employed, but will still be found occasionally. This system is a combination of two single-phase systems and ordinarily requires four wires in distribution, although three can be used.

The potentials in the two phases do not coincide in instantaneous values, but are a quarter of a cycle out of phase, in a relation like the cranks on opposite drive-wheels of a locomotive. In the four-wire arrangement the phases are not connected with each other, but in the three-wire arrangement one of the wires is common to each phase. A two-phase distribution system is shown in Fig. 2; the

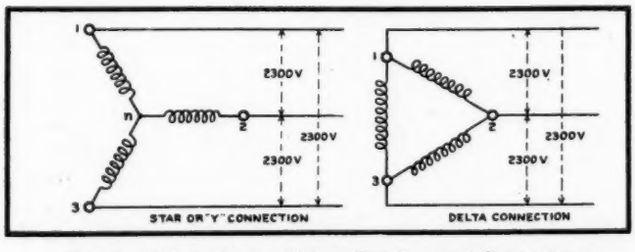


Fig. 3. Three-Phase Alternating Current Connections.

primary side is on a four-wire basis, while one of the secondaries shows the three-wire arrangement.

If the primary four-wire distribution in Fig. 2 had instead been three-wire, the voltage of each phase remaining the same at 2,300 volts, the voltage between the outside or free phase-wires would have been 1.414 times the phase voltage (2,300) or 3,252. volts.

It is feasible, of course, to give lighting service from each phase of such a system, just as though it were a single phase distribution system and this is sometimes done; but in order to maintain better regulation of voltage (greater constancy) it is preferable to have the large motor load on separate primary mains or feeders.

Three-phase distribution is commonly on the three-wire system, although four wires may be and sometimes are employed. But it is essential to recognize, first, that there are two standard methods of connecting the phases of a

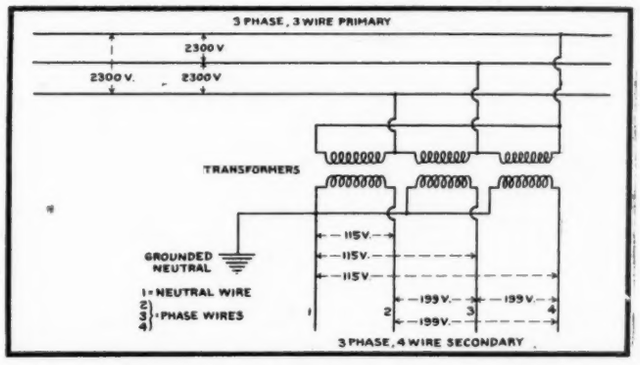


Fig. 4. Three-Phase Distribution with Four-Wire Secondaries.

three-phase generator,—or bank of transformers. These methods are respectively termed the star and the delta; the first is also termed a Y connection.

Fig. 3 shows these two methods; the generator terminals are shown as connected to line without intervening collector rings, which would be the case (omitting the switchboard) if the field revolved instead of the armature.

A three-phase system is comprised of three single-phase elements, whose instantaneous values of voltage or potential are displaced in phase one-third of a cycle from each other, or in a relation analogous to the three cranks of a three-cylinder engine, 120° apart. As a result, the potential difference between any two of the three line-wires (or phase wires) shown in Fig. 3 is the same, as regards effective magnitude.

The potential difference between phase wires is termed the delta voltage, and is the voltage by which such a system is usually rated or spoken of, in alternating current practice. Referring to the delta connection in Fig. 3, it is apparent that each generator or transformer coil generates a total potential equal to the delta potential of the line, or 2,300 volts as given in the figure. In the star connection, however, the generated potential in each coil is only 57.7 per cent. of the delta potential.

Referring to the star connection in Fig. 3, where the delta potential of the line is 2,300 volts, the generated potential of each coil is only 1,328 volts. If the potential of each coil, for example, were 2,300 volts, the delta potential would be 3,984 volts. The star voltage, as it is termed, implies the voltage of any coil in the star method of connection, and thus it is important to state in every case which voltage is meant although the delta voltage is generally inferred if no qualification is stated.

The point designated as *n* in Fig. 3, in the star connection, is termed the neutral point. It is quite common practice to ground the system at this point, on transmission circuits, and this is what is meant by the term grounded neutral. It follows in every case where the neutral is grounded that the voltage between any phase-wire and ground is 57.7 per cent. of the voltage between any two phase-wires.

It is essential always to know how three-phase apparatus is connected and whether or not the neutral is grounded. Of course it is impossible to ground the neutral without the star or Y method of connection.

The most common method of three-phase commercial distribution is by means of three wires, as shown in Fig. 3. In some cases, however, the four-wire system has been employed. Typical transformer connections are shown for the latter case in Fig. 4. Such a system is only used, ordinarily, where motors of considerable size are served.

When the demands on a central station for both lighting and motor service are large, it is common practice to employ three-phase generators, and distribute the energy for lighting over single-phase circuits direct from the station, while the motor load is supplied over separate three-phase

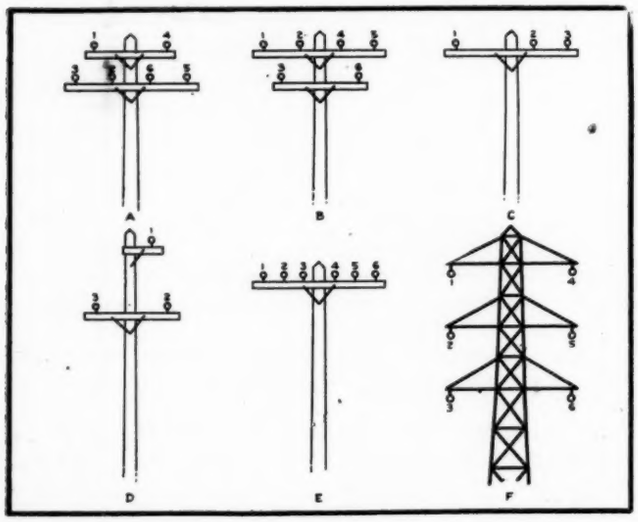


Fig. 5. Typical Arrangements of Three-Phase Circuits.

three-wire feeders; the various single-phase lighting feeders are grouped on the generator phases so as to distribute the whole load evenly between the phases, or as nearly so as possible.

The transformers illustrated in Fig. 4 are delta connected on the primary side and star connected on the secondary, with grounded secondary neutral. The arrangement of the delta and star connections is sometimes reversed; for instance, if the primary distribution is a 4,000-volt delta system, the transformer primaries might be connected in star relation and wound for 2,300 volts each, with the secondaries connected in delta for three-wire service. When the power consumption is small the three transformers are sometimes replaced by a combined (or single unit) three-phase transformer, within a single casing.

There are many methods of grouping alternating current circuits on a pole line and a description of some of the more common methods will probably be helpful. Of course a single-phase circuit is confined to two wires, except in the case of three-wire secondaries, and therefore there is no need of dwelling upon such circuits,—as they are so familiar.

Two-phase circuits in most cases have four wires, although three are sometimes used. When four wires are used, the grouping is usually no different from the case of two single-phase circuits arranged on the same cross-arm. In such a case there is no indication, ordinarily, whether the system is two-phase or simply two single-phase circuits, until a set of transformers is reached which supplies power for motor service.

The methods of grouping the three wires of a three-phase circuit are numerous. One very common method is that of placing the three wires so that they lie at the apexes of an equilateral triangle; another method is that of placing them on three adjacent pins of the same cross-arm. But the different arrangements are too numerous to describe here.

A few of the plans quite frequently seen are illustrated in Fig. 5. The insulators have been omitted in all cases for the sake of simplicity.

In the circuit arrangements which appear in Fig. 5, two complete circuits are sometimes shown and in other instances only one. The conductors numbered **1-2-3** always represent one complete circuit, and **4-5-6** another. The arrangements at **A** and **B** are very common; the one at **C** is often employed when it is intended ultimately to add a second circuit, as shown at **A** or **B.** The plan shown at **F** has been adopted on some of the recently built transmission lines; the conductors there are suspended below the supports by means of suspension insulators and short tie-cables.

Returning briefly to the different systems of commercial distribution, it may sometimes puzzle the field inspector to understand the system of series lighting, because the conductors seldom appear in pairs and seem often to take a hap-hazard route.

It is rarely, if ever, the practice to keep the two sides of such a circuit on the same route and quite frequently they are some blocks apart. On account of the fact that all lamps are connected rigidly in series with the line there is no occasion, from one standpoint, to follow any system except to find the shortest route to serve a given layout of lamps. This practice works serious injury on telephone service in many instances and it is a matter of regret that series lighting circuits are not laid out with greater care to prevent inductive interferences.

A field inspector will almost invariably make no mistake in taking down the full manufacturer's data from the name-plates of generators, transformers, motors, etc., at the same time that he traces out the circuit connections. This data in most cases is very complete and gives directly, or with the aid of the manufacturer's bulletins, much of the information sought for.

Every telephone manager should caution his field inspector against coming in any way into contact or even close proximity, with the power system at any point, especially if the inspector is inexperienced in handling power circuits or not highly familiar with them. Regardless of how much he knows he should follow the only one safe course,—to let everything absolutely alone.

Energy Losses in Telephoning.

The first part of an account of extended experiments in which the different losses in telephone apparatus were determined by F. Breisig recently appeared in *Elecktrotechnische Zeitschrift.* For the tests according to a digest in *Electrical World,* a permanent alternating current of a frequency of 800 cycles per second was used. The usual connections of the central battery system were used. It was found that during receiving out of the total electrical energy received 70.5 per cent. was lost in the transmitter, 1.6 per cent. in the bell, 18.4 was supplied to the telephone, the loss in the primary winding was 3.4, that in the secondary winding was 3.4 and the losses in the other coils 2.7. The chief source of loss is in the transmitter, and, since it is entirely unnecessary while speaking, it might be short-circuited at that time, but this would cause trouble on account of its high resistance. To avoid this trouble and to reduce the alternating-current impedance a condenser of 2 mf was connected in parallel with the transmitter when receiving. When speaking it was disconnected by means of a simple switch. With this arrangement the above figures of losses were greatly changed. The loss in the transmitter was now only 12.1 per cent., the loss in the bell 1.1 while 57.2 per cent. was delivered to the telephone and 29.6 was lost in the coil.

Department of Railway Telephony

These Pages are Open for Brief, Practical Letters from Railway Men Interested in the Progress of the Telephone—A Recognized Medium for the Exchange of Technical Information, Personal Notes and News of Progress in any Branch of Railway Telephony

Telephone Cable Transmission.

By John B. Adams, Electrical Engineer to the Waterbury Co.

Lead encased cable is used so extensively in the modern telephone plant, that its use has become one of the most important problems to be considered in the general development of the plant. That part of the subject of telephone cable pertaining to its installation and maintenance has been, in general thoroughly covered in various trade publications and catalogs, and I shall not here attempt to add anything pertaining to those subjects. Concerning the subject of cable transmission, however, there seems to be but a limited amount of reliable information available, exclusive of text books and papers which treat the subject theoretically.

It is my purpose in presenting this paper, to place before telephone men reliable and practical information relating to cable transmission, specifications and manufacture, which, it is hoped, will prove of value to them in solving transmission problems. There have been issued pamphlets and catalog literature, purporting to treat the question of transmission of telephone currents in cable along practical lines, but these, unfortunately, contain fundamental statements, which, to any one conversant with the present day principles of the art, are known to be erroneous, and the formula expressing the loss in transmission so misstated as to lead to entirely erroneous conclusions and results.

Transmission.

The factors which determine the transmission efficiency, or talking value of any circuit, are resistance, capacity, inductance and insulation. As applied to a telephone circuit made up of two copper conductors of equal size, insulated with dry paper, twisted together and enclosed in a lead sheath, as a pair of conductors in ordinary telephone cable, it has been found as a result of actual transmission tests and measurements, that the inductance and leakage are so small compared with the resistance and capacity, as to be entirely negligible in their effect on the transmission.

The loss of volume in transmission, or attenuation of the current as it is called, in a telephone cable circuit, is, therefore, dependent only upon the resistance and capacity, and the loss may be stated as being proportional to the square root of the product obtained by multiplying the resistance of the loop in ohms, by the mutual capacity in farads: i. e. Loss $= K \sqrt{R \times C}$, in which R is the loop resistance, C the mutual capacity and K a constant assumed as equalling the average frequency of the voice currents.

As an example; in the calculation of transmission losses in cable, suppose it is required to find which of the following cables will give the least transmission loss per mile, and also the length of each cable which will give the same loss or the same volume of transmission:

	Cable No. 1	Cable No. 2
Conductors, gauge B. & S.....	19	22
Resistance, ohms per mile loop....	86	172
Mutual electrostatic capacity....	.075	.075

Apply the formula for transmission loss as above stated:

Loss in cable No. $1 = K \sqrt{86 \times 0.75} = 2.54$ K.

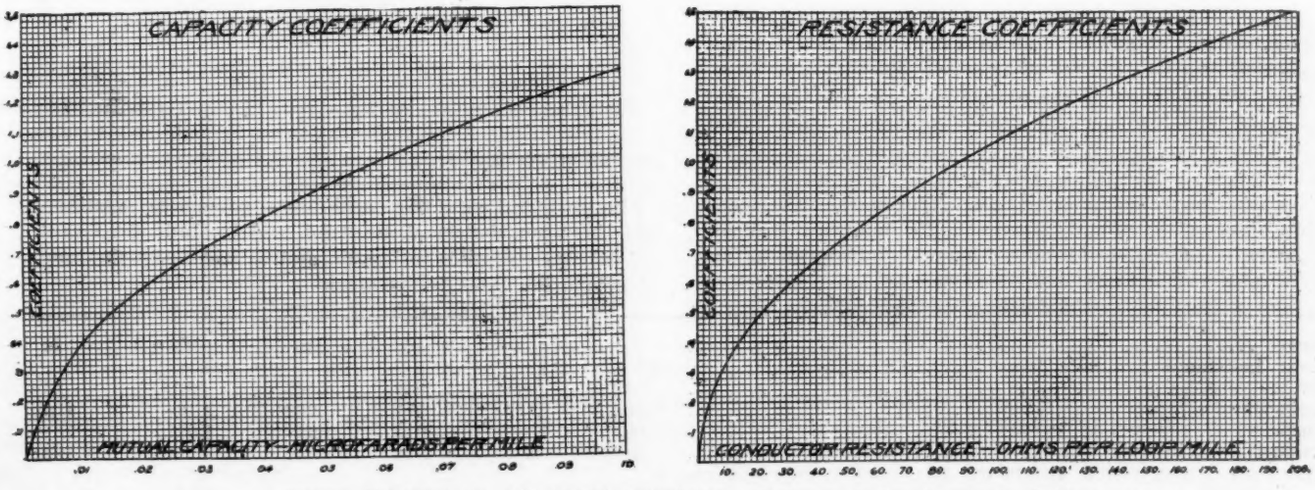
Loss in cable No. $2 = K \sqrt{172 \times .075} = 3.59$ K.

Therefore, the loss in cable No. 2, 22 gauge, is $\frac{3.59}{2.54}$ or 1.41 times as great in cable No. 1, 19 gauge; or, with the same capacity, 1.4 miles of No. 19 gauge cable will give the same volume of transmission, i. e. the same talking efficiency, as one mile of No. 22 gauge cable. This result has been confirmed by a large number of transmission tests. *With the formula for loss in telephone cable, incorrectly stated as being proportional to the simple product of resistance and capacity (the old "K-R Law")*, the loss in the No. 22 gauge cable would be twice that for the No. 19 gauge cable, a result which has been proven to be entirely incorrect by actual test.

Transmission Standard.

In calculating values of telephone transmission, it will be found convenient to adopt some standard for transmission loss, i. e., some unit of loss in terms of which the losses in any circuit can be expressed. In the absence of any accepted name for such a unit, a standard of this description which has been quite generally adopted by telephone engineers in this country, is a cable having a resistance of 88 ohms per loop mile (44 ohms per conductor mile), and a mutual electrostatic capacity of .06 microfarads per mile, with no inductance and

*A paper presented at the convention of the Association of Railway Telegraph Superintendents.


CAPACITY COEFFICIENTS
MUTUAL CAPACITY - MICROFARADS PER MILE
RESISTANCE COEFFICIENTS
CONDUCTOR RESISTANCE - OHMS PER LOOP-MILE

Curves Designed to Aid Rapid Calculation of Transmission Losses in Cable.

no leakage. This is known as a standard cable and losses expressed in terms of this unit are referred to as losses in miles of standard No. 19 gauge cable, or, simply miles of standard cable.

As an example of the use of this standard, in calculating losses, suppose it is required to find the relative talking efficiency of the following circuits:

Gauge	Loop Resistance Per Mile	Mutual Capacity Per Mile
13	21.5	.07
16	42.5	.07
19	85.0	.075

13 gauge $\sqrt{\frac{21.5 \times .07}{88 \times .06}}$ = .534 miles standard cable.

16 gauge $\sqrt{\frac{42.5 \times .07}{88 \times .06}}$ = .75 miles standard cable.

19 gauge $\sqrt{\frac{85 \times .075}{88 \times .06}}$ = 1.1 miles standard cable.

That is, the losses in one mile of the above cables are equivalent to the losses in .534, .75 and 1.1 miles of standard cable.

In order to further simplify the calculations necessary to compare the talking values of different circuits, two curves have been prepared by the use of which the transmission loss in any cable circuit in terms of standard cable can be calculated by a single multiplication as follows:

Obtain from the curve of *"Resistance coefficients,"* the coefficient corresponding to the resistance per mile loop of the circuit under consideration. Obtaln from the curve of *"Capacity coefficients,"* the coefficient corresponding to the mutual electrostatic capacity of the circuit. The product of the two will be the loss in the circuit in miles of standard cable.

As an example of the application of these curves circuits have been worked out as shown in the table appearing at the foot of this page.

(To be concluded.)

Sandwich Selectors in an Intercommunicating System.

The Indianapolis Belt Railroad and Stock Yards Co., which in spite of its name, has nothing whatever to do with any railroad, and is simply a Stock Yards company, has installed an intercommunicating telephone circuit consisting of eleven stations scattered through its yards and offices, employing the Sandwich selector. Some of the lines are one-half mile in length. This shows that the advantage of the selector is appealing to others besides railroad men. An ordinary intercommunicating set would have required a large amount of cable, the expense of which made it out of the question. The company was led to adopt this system after seeing its successful operation on the Indianapolis Union Railway, whose dispatcher's office is located at the Stock Yards.

First Loaded Submarine Telephone Cable in America.

The British Columbia Telephone Co. is now in correspondence with the Siemens Co., of London, England, one of the largest submarine cable manufacturing firms in the world, regarding the securing of a loaded submarine cable which it is proposed to lay under the Gulf of Georgia between the main land and Vancouver Island. The chief terminals of this cable would be Victoria and Vancouver. The cable being discussed is of similar type to the one now laid and in operation under the English Channel, and known as the Paris cable. The cable desired is one of four conductors, which will give two pairs straight and a phantom circuit, making three circuits altogether.

August Meeting of A. I. E. E. Directors.

Authority to form sections in Vancouver, B. C., and Lynn, Mass., was granted at a meeting of directors of the American Institute of Electrical Engineers, held Aug. 22, at New York.

President Dunn announced the appointment of the Institute Committees for the present administrative year. The following is a list of the chairmen of these committees: Executive, Gano Dunn; Finance, A. W. Berresford; Library, Samuel Sheldon; Meetings and Papers, H. W. Buck; Editing, W. I. Slichter; Board of Examiners, W. G. Carlton; Sections, Paul M. Lincoln; Code, George F. Sever; Law, C. A. Terry; Railway, Frank J. Sprague; Educational, A. S. Langsdorf; High Tension Transmission, David B. Rushmore; Industrial Power, W. H. Powell; Telegraphy and Telephony, Bancroft Gherardi; Electric Lighting, P. Junkersfeld; Electrochemical, Albert F. Ganz; Power Station, S. D. Sprong; Indexing Transactions, George I. Rhodes; Public Policy, Henry G. Stott; Intermediate Grade of Membership, Percy H. Thomas; Historical Museum, T. C. Martin; Committee on Relations of Consulting Engineers, Francis Blossom; United States National Committee of International Electrotechnical Commission, C. O. Mailloux; Code of Ethics, George F. Sever.

The following representatives of the Institute were also appointed by President Dunn: On Joint Committee on Engineering Education, Charles F. Scott and Samuel Sheldon; on American Year Book, Edward Caldwell; on Resuscation Commission, A. E. Kennelly; on Electrical Committee of the National Fire Protection Association, George F. Sever.

The board elected, by ballot, the following three members of the Board of Directors to serve upon the Edison Medal Committee for two years: Lewis B. Stillwell, H. H. Barnes, Jr., and S. D. Sprong. The board also confirmed the appointment by the president of Frank J. Sprague and Schuyler Skaats Wheeler as members of the Edison Medal Committee for terms of five years.

The following resolution was adopted:

"RESOLVED that the Committee on Conservation of Natural Resources be discontinued and the president be authorized to appoint a committee of seven on Public Policy. The duties of this committee shall be to report to the board on such questions of Public Policy as the board shall refer to it, and to call the attention of the board to such matters of Public Policy as the discretion of the committee prompts."

The president appointed on this committee: Henry G. Stott, chairman, H. W. Buck, John J. Carty, John H. Finney, Charles W. Stone, Calvert Townley and James G. White.

The president appointed Messrs. Peter Junkersfeld and William B. Jackson, of Chicago, to represent the Institute at the American Mining Congress, to be held in Chicago, September 26-29, 1911.

The British Post Office will lay a submarine telephone cable between Holyhead, England, and Ireland. This cable will be fifty-six miles in length, and is said to be the longest submarine cable in the world.

Gauge	13	14	16	19	20	22
Ohms hesistance per mile loop	21.5	28.	42.5	85.	120.	190.
Mutual capacity per mile	.072	.078	.068	.065	.072	.078
Coefficient R. (from Res. curve)	.495	.564	.695	.982	1.168	1.470
Coefficient C. (from Cap. curve)	1.095	1.080	1.065	1.042	1.095	1.140
Product—loss in miles standard cable	.542	.610	.740	1.023	1.380	1.680
Equivalent Transmission (Standard of 30 miles standard cable) miles	55.	49.	41.	29.	21.7	17.8

Interesting Talks About the Science of Business Building

Second of a Series of Articles Discussing Conservative Side of Business, of Which First Was Printed August 12—Who are the Salesmen in the World of Commerce?—What Makes a Successful Business?—Team Work that Counts—Making the Individual a Success

By A. F. Sheldon

Formulator of Science of Business Building, and Editor of the Business Philosopher

At the close of my last article, I asked this question, Who are the salesmen in the world of commerce?

My reason for asking this question is the fact that there seems to be quite a general impression among business men that it is those only who directly market product, sell, or take orders for the product of any given commercial institution, who may or should be termed "salesmen."

If we wish to be technical, and follow dictionary definitions, possibly this is correct, but it is better to be practical than too technical, and the test of practicability is result-getting; in the commercial world—business-building.

The way to get results—profit-making business—is to follow this definition: The salesmen of the world in the realm of commerce are the commercial institutions themselves. Whether an individual business, a partnership, or a corporation, there is just one salesman for each commercial institution in existence today—the institution. It is a composite being. If a partnership or corporation, it is a legal entity.

Everybody, from porter up to president, is a part of one salesman—the institution. The result of the efforts of the institution—its work as a whole when successful—is to market its product at a profit.

As we saw in the first talk, the accomplishment of this result is dependent upon the service rendered. This in turn depends upon the efficiency of each unit.

Every human being in an institution must be a success for the institution itself to be a complete success.

Every human being in it must be a service-renderer, and if he is that he is bound to be a business-builder and, by all the rules of commercial logic, a union of business-builders can result in one thing only—a profitable business.

If each person engaged in the service of the institution is right, the equipment must and will be right. Equipment is effect; man is cause.

The right cause (man) will provide the right effect (equipment).

A house is known by the customers it gets and keeps. It is the repeater that counts—the pleased buyer, who buys and buys again. He advertises your service by continuing his patronage. Strive to make many like him. He is the most potent factor in commercial success—the pleased patron, who buys and buys again.

Both the getting and the keeping of customers or patrons depends upon the efficiency of each unit in the composite salesman—the institution. Its success is the sum of successes of the individuals engaged in its service. Make each unit right, and the whole will take care of itself.

"E Pluribus Unum," "United we Stand, Divided we Fall," was never said more truly of our great country than of every commercial institution in it.

Successful institutions are nothing more than the combined efforts of successful men. The house as a whole must persuade the buying public to purchase its product at a profit.

Persuasion works both ways. People are persuaded to buy, people are persuaded not to buy, people are sometimes persuaded by one individual part of the composite salesman to buy and then are persuaded not to keep on buying by some other part of the composite salesman.

This is not done intentionally, of course, as a rule; but it is results that count, and persuasion not to keep on buying—not to become a repeating patron—is the result of the words or deeds of an inefficient unit.

"A house divided against itself can not stand."

Nineteen hundred years ago this great truth was uttered. It is one of the eternal truths of all time. It is as true now as it was then. It will be as true tomorrow as it is today. In the business world, united effort spells success. Disunity, division, clash of interest—these constitute the prologue of the drama that ends in the bankruptcy court.

I have known the good work of a good getter of customers—the salesman in the technical sense of that term—to be all undone by the untactful work of the credit man; or again, by the short answer or smart remark of the repair man.

The inefficient work of a bookkeeper, who should be driving a mule instead of pushing a pen, has driven away many a customer. People do not like to get incorrect bills. Poorly written letters, incorrect spelling, lack of efficiency of any kind on the part of the stenographer and typist often spoils business.

What makes a successful business? I answer: Not only the business obtained, but the business retained. The first is the seed, the second is the tree that bears the fruit of profit.

Business-building consists in keeping the patron once made, and making his good-will a magnet to attract other patrons. Great commercial institutions are not built by the patrons of the day, but by the patrons of the years, whose children, in time, will become patrons. An endless chain of patronage is the only hope for the success of a great business house.

It is all very plain when we once wake up to the fact that confidence is really the basis of all trade. It is not only the basis, but the very atmosphere in which it grows.

Every thought you think, every word you speak, every act you perform, adds to the sum of the confidence the buying public has in your institution, or it subtracts in some degree from it. There is no middle ground. There is one kind of straight sticks only. All sticks are either straight or in some degree crooked. The words you speak and deeds you do are either right or wrong. They either tend to beget and strengthen confidence, or to destroy it.

This is true of every one connected with the composite salesman—the institution. To get results, to render service, and therefore build business—in fact, to make a profit of each department of the telephone or any other business—each department must work in harmony within itself and with all the others.

There is often too much rivalry between departments and too much rivalry between people in departments. Unselfish co-operation constitutes the lubricating oil for the machinery of business. Apply it, to avoid friction. Selfishness is a sand that cuts and wears the machinery out.

In the ball team that wins, each player is willing to make a sacrifice hit, if necessary. It's the team, the team, the team! Anything that's fair to make the team win! It's the star team spirit in business that wins, not the team of stars.

The workers in an institution are not independent, neither are they dependent. All are interdependent. Stand so close together that you support one another.

"E Pluribus Unum." "United we Stand, Divided we Fall." Make that the motto of your institution, as it is the motto of our nation. Then no one can "fall down."

When soldiers would pass over a stream the force of which

would hurl one man from his feet, they link arms, form a long file and plunge in. So united, they successfully ford it. What no man could do a united mass of men can do, and yet the combined effort results in the profit of each individual.

In the world of commerce there are rivers that would prove just as disastrous for one man to try to pass over alone. Don't let him do it. Let him call his companions, and go over with them triumphantly. Their victory will be his victory. All will win, and yet each man will be an individual victor. Isn't that the noblest kind of victory in which all triumph and no one suffers defeat?

Are you the boss? If you are, I want a word with you. If you are an employe; that is, the right kind of employe, the employe who has determined on becoming a "boss" some day, this is of interest to you, too.

A great business man said to me recently: "I quit thinking about the success of the company, dividends, et cetera, a long time ago, and transferred my thought to make each man and woman connected with my institution a success. As soon as I did that, I found that the success of the institution began to take care of itself."

If the employes in your institution are not successes, then your institution is not a success. Do you feel that way?

What is the greatest power in business? What is your answer? Think it over well and long. It is important enough to deserve that. In my next talk I shall tell you what I think it is.

A Word from an Independent Operator Who Believes in Interconnection of Competing Lines.

F. H. Clark, president of the Clayton Telephone Exchange, Clayton, N. M., sends TELEPHONY a note with the renewal of his subscription, in which he says:

"The A. T. & T. Co. will be in our city with a long distance No. 12 copper circuit, connecting us with the outside world by way of Raton, N. M. You understand I am Independent from the top of my head to the sole of my foot, but I am a strong believer in universal connection, thus allowing the use of lines for service, no matter whose lines—Independent or Bell. You will admit that we small fry Independents in this sparsely settled country need every honest dollar we can make to operate our business, and for the purpose of rebuilding when the lines rot down."

Mr. Clark states that he will probably have to rebuild his local plant, enlarging his switchboard from 150 to 300 drops. He reports good business both at Clayton and at his Texline, Tex., office.

Kentucky Independent Systems Increasing in Number and Strength—Lusty Group in South.

Many new companies are being formed in Kentucky this year and considerable building of local and toll lines is being accomplished. The Corbin Home Telephone Co. is one of the concerns recently organized. It is capitalized at $20,000, and will at once proceed to install a plant with an initial capacity of 400 stations in Corbin. The equipment will be Kellogg throughout. The officers are: John Woodward, London, president; Lyman Benjamin, Barbourville, vice-president; C. B. Sullenberger, Middlesboro, general manager.

The Corbin company is one of a group promoted, built and operated by the same interests, Mr. Sullenberger being general manager of them all. The towns in this group, which are now, or to be at once, connected by toll lines, include Corbin, Middleboro, Barbourville, London, Williamsburg, Harlan and Jellico, Tenn.

New Telephone Cable Under British Channel.

A double-loaded cable is to be laid between La Panne, in Belgium, and St. Margaret's Bay, England.

Samuel Insull Discusses Public Relations.

At a luncheon of the Canadian Electrical Association, Mr. Samuel Insull, president of the Commonwealth Edison Co., of Chicago, said:

"The matter of public relations is one that has been brought home to a great many industries, not only public service industries, but all classes of industries in the United States in the last few years, and I think you people on this side of the line might very profitably study what has been going on in connection with public opinion in the United States, and the relation of public opinion to corporate affairs.

"Most of the troubles that have occurred in the United States found their origin in an absolute neglect of public opinion in the case of general industrial corporations, and in a neglect of local good will on the part of the local public service corporations. Having obtained a franchise if you are men dealing with the public from day to day, the first thing you want is their good will, and if you are managers of properties the first thing you want on the part of your employees is to see that they do everything to get that good will. I do not mean to say that you should give way to every whim or caprice, or that you should bow to every demand of the politician who is bidding for public favor.

"That is not at all necessary in order to get general public good will. You have to remember, as one of your members stated in his paper this morning, that the community are your customers, and that you have to put yourselves in the position of your customers. Supposing one of you went into a store to make a purchase and you wanted a certain article, say an article of apparel of a certain color, say white, what would you think if the clerk behind the counter reached up for a roll of goods and said, 'Well, our rule is you have got to take green.' You would walk out and go somewhere else, and if you wanted white you would buy the article at some other place. Now, there are a great many things that public utility companies do that are just as absurd as that, and my last word to you is, above franchises above all questions of money making (because that will help you to make money), above all questions of engineering, consider your relations with the community in which you are working and in which you have to live, because your plant cannot be picked up and moved away."

Breaking Into the Telephone Monopoly in the State of Louisiana.

"Judging from the small amount of Louisiana news, your readers must think that everything is 'monopolized' down here. While this is possibly true in part, yet there are a few of us who are still in the game," says R. B. Dool, of Farmerville, La., in a letter to TELEPHONY.

"The Cumberland opened up here December 1, 1910, and hasn't as yet put us out of business. We have installed about forty new telephones since January 1, and the orders are still coming in. If it is a good crop year nothing but lack of funds will prevent us from connecting up the surrounding country.

"At Columbia, where they opened up April 1, they have hurt us a little more, yet there have been more than fifty subscribers connected with our exchange since January 1, mostly rural lines owned by the farmers. But as I look at it every Independent telephone connected in North Louisiana helps every Independent owner in that part of the state.

"The exchange at Marion is a small one, but is a good feeder for the exchange here, as this is the county seat.

"The rates here are so much better than in the northern states that it should be an attractive field for telephone men, and it can't help but develop wonderfully in the next five years, and the man on the ground will surely be helped."

Practical Letters from the Readers

Arrester Saves Telephone from Heavy Lightning Stroke.

About 7 p. m., August 17, the region west and south of town was visited by a small tornado, accompanied by rain, hail and severe lightning. Next day a farmer living near the head of Lake Andes (which has the best bass fishing in the United States) reported that his telephone was struck by lightning, and asked us to bring out a new one. On arriving I found that the bolt had apparently struck the second pole from the house. I had a line arrester on the third pole from the house. It took a sliver out of the second pole and followed the line into the house.

I always run my iron wire, both line and ground, to within six inches of the entrance and use No. 16 weather-proof copper to go through the wall. For protection I have a carbon and fuse arrester above the telephone. The lightning burned up most of the copper wire, shot the carbons out of the arrester, stunned the whole family, and went down the ground wire. The mother was unconscious several minutes, and the baby so long they thought it was dead, but no one was burned or otherwise hurt. The telephone, and the wires between the telephone and the arrester, were unharmed. I have never had a farm telephone burned out. We have 200 farm telephones, all grounded lines, and have been running about five years.

Ira S. Burnett, Mgr.,
Armour, S. D. Armour Telephone Co.

P. S.—Your cartoons on the rural line districts are the best ever.

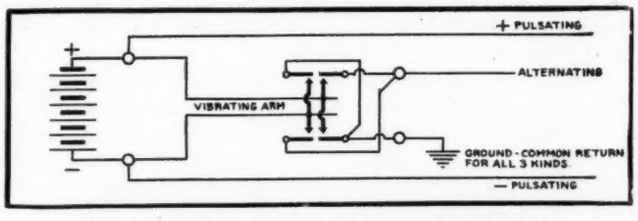
Good Ground Cures Pole Changer Trouble.

Mr. Fallgatter, of Oakley, has just pulled me out of a case of selective ringing trouble, which may be interesting to some of your readers because it is so unusual.

We have had in use the + and —, biased bell, selective ringing for some years, using two 2,500 ohm bells on a grounded line, and getting the positive and negative currents from a Warner pole changer. These pole changers are made with extra springs for + and — ringing, but the diagram shows how I use one which has only the four springs.

A couple of months ago we began having trouble, which no amount of adjusting bells or machine, or putting on more or less battery, would cure; and the trouble would not remain the same. Sometimes both bells would ring, sometimes neither, but usually the wrong bell would ring quite well and the right one not at all, or not as much. These troubles would come in for a few minutes or an hour, or half a day, but were not in all the time.

After exhausting our knowledge and patience, and going



Special Pole Changer Wiring for Biased Bells.

so far as to buy a new pole changer, we called in Mr. Fallgatter. The first thing he did was to lay his fingers on the pole changer terminals. Whenever it was used for ringing he would get a shock that sent him to the ceiling. He said this must be caused by an inductive kick, and after a little thought suggested that we put in a new switchboard ground. We did so and it cured the trouble immediately. The bells are working along without the least trouble again, just as they did for years before.

Now, bad grounds are usually noticed by cross-talk where more than one circuit uses the same ground; perhaps we did not notice it that way because the majority of our lines are metallic, but that is just where the trouble lay. A loose connection in our ground wire caused the trouble to vary. When the ground was poor, and we were trying to ring a positive bell, for instance, the positive pulsations would go out and "charge up" about 100 lines that were connected, and between pulsations these charges would kick back and ring the negative bell—very simple, after I saw it.

Russell, Kans. W. T. Frier, Russell Tel. Co.

Batteries Stolen for Gasolene Engines.

The other day I read your editorial, "Use a shotgun." We are having the same trouble here, mostly with owners of gasolene engines. We use a certain kind of dry cell exclusively, and it certainly makes a man feel like saying something when he drives six or eight miles to replace batteries and finds a pair of worn-out cells of a brand he never heard of.

One subscriber took the cells from the telephone, failed to put in the old ones and then reported his telephone in trouble. Our troubleman was astonished to find the batteries missing and, on explanation being made, he demanded pay for his time and expense, saying that if not forthcoming he would remove the instrument. He got it.

Some of our farmers are pretty foxy. They remove the good batteries from our pasteboard cells and replace them with their old ones. When we kick they claim they are the batteries we put in, and refer to the fact that their cells are different from ours. We have got around that by putting a secret mark on the cell itself.

This is really getting to be a serious matter, and any suggestion you can make to stop it will be most welcome.

Waterford, Pa. H. O. Woodward, Manager,
Erie County Telephone Co.

Directory Pointers from a Michigan "Live Wire."

B. J. Potter runs the Okemos Independent Telephone Co., of Okemos, Mich. Runs is the word—anything that gets tied up with Mr. Potter moves fast. He began with spoon and bar, and now owns a good-sized telephone system. He is superintendent, foreman, wire chief, inspector, troubleman, manager, and drives a rural mail route beside.

TELEPHONY asked Mr. Potter to tell its readers how he produced his directory—a first-class little book of 24 pages and cover, and received the following, under letter head carrying the "shield" and the statement that his company is allied with the Michigan Independent Telephone Association, also the National Independent Telephone Association:

"The 250 copies cost us $30, printed by the Phonoprint Co., of Defiance, Ohio, who have done all our printing for a number of years. In all this time we have never received a poor job of any kind. They have an 'ad' in TELEPHONY.

"Yes, we solicited the advertising and used the arguments that it went into nearly every home in the community, was handled several times each day, etc. We got $1.25 each for 18 'ads,' total $22.50; cost of printing above this, $7.50.

"Come over here and see what we have; no competition, a bunch of the best satisfied subscribers in this part of Michigan, an exchange outfit that is up to date and doing business every day in the week, every second—day or night; all lines metallic. We have an auto and three horses."

Queries on Theory and Practice

By Arthur Bessey Smith, E. E.

Alternating Current in Iron Wire.

Please furnish me formulas for calculating inductance and ohmic resistance of iron wire at varying frequencies.

The complete formula for calculating the resistance of wire to alternating current is simple enough, but its application requires care in getting the correct quantities to substitute. A simpler formula applicable to iron wire only and at a given temperature, will be given also.

R = resistance to direct current
R' = resistance to alternating current
f = frequency of alternating current in cycles per second
A = cross section of the wire in circular mils
P = permeability of the metal in C. G. S. units
t = temperature in degrees centigrade
a = temperature coefficient of the wire in degrees centigrade
C = percentage conductivity of metal, referred to Matthiessen's copper standard at zero temperature centigrade.

Then the ratio between the resistance to alternating current and that to direct current is given by

$$\frac{R'}{R} = 10^{-5}\sqrt{\frac{fPCA}{1+at}} + 0.28$$

For E. B. B. iron wire this formula reduces to the following:

$$\frac{R'}{R} = 479 \times 10^{-6}\sqrt{fA} + 0.28$$

It is assumed that the temperature is 20 degrees centigrade, or 68 degrees Fahrenheit. The area of the cross section of a wire in circular mils is obtained by squaring its diameter in mils. A mil is a thousandth of an inch. For instance, if a wire has a diameter of 0.100 inch, its diameter in mils is 100. Squaring this we have $100 \times 100 = 10{,}000$ circular mils.

Phantom Will Not Relieve Heavy Ground Lines.

I enclose a rude diagram of nine country lines. Lines 1 and 2 are both heavily loaded and are on the same poles and there are no telephones between A and B, about two miles. Lines 3, 4, 5, are ten miles long, carry no telephones, and are used for through lines. Line 6 is heavily loaded.

Now we want some more circuits, and want to make some changes to save running any more wires. Will you tell us how to arrange it so we can increase the circuits by phantoming? Write us where to put the coils, and what size to get, and where we can get them.

Phantom circuits can not increase the carrying capacity of wires if they are already used with ground return. They can offer such relief only to metallic circuits. If you consider carrying capacity only, the ground return, single-wire line will always give you the most circuits. Four single wires give but three circuits when combined as two "physical" metallic lines and a phantom. Since you do not say or show in your diagram that your circuits are metallic, we assume them to be ground return lines, so that you can not increase your circuits without stringing more wire.

A Simple Explanation of the Elements of a Common Battery Telephone System.

H. Harrison recently contributed to the *Sibley Journal of Engineering*, Cornell University, an article explaining in elementary form some of the ordinary principles of telephony. The article was later reproduced in the *Scientific American Supplement*, and on account of the simplicity of statements of principles has appealed to telephone men in the small exchanges who suggested that some of TELEPHONY's readers who did not see the original article would be interested in certain parts of it.

The explanation of the common battery system is as follows:

The basic elements of a common-battery system are shown in Fig. 1. The subscriber's equipment consists of a transmitter, receiver, induction coil (not shown), switch hook, polarized bell, and condenser. The subscriber's pair of wires terminate at the central office switch board in what is termed an answering jack. The subscriber's lamp with its

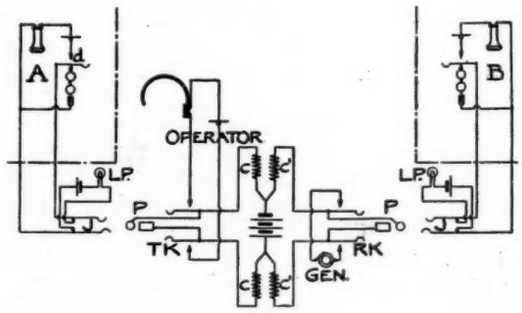


Fig. 1.—Talking and Signalling Elements Simplified.

battery is connected to the answering jack springs as shown. Normally the lamp circuit is open on account of the condenser which is a bar to the passage of unvarying currents.

The common battery or talking battery is wired in multiple between the answering and calling cords. Each pole of the battery is connected to these cords through a divided repeating coil, one limb of each cord being connected to one of the four windings of the repeating coil. The operation of a transmitter in circuit with either cord will produce a varying current which will act inductively, through the repeating coils, upon the other cord.

Thus, is A wishes to speak to B, he takes the receiver off the hook and unconsciously makes contact at d which lights his central office lamp. On seeing the light, the central office operator inserts the plug of the answering cord into A's jack, and puts her telephone instrument in circuit with A by pressing the talking key. (As an incident to the insertion of a cord plug into a jack, the jack springs are pressed away from the lamp circuit contacts, thus putting the lamp out.) When A tells the operator that he wants B she inserts the plug of the calling cord into B's jack and presses the ringing key. This sends alternating current out on the line, through the condenser (which is no bar to alternating current) and the bell. When B takes his receiver off the hook, communication between A and B is established.

When B is transmitting, the windings $c'c'$ will operate as the primary windings of a transformer, of which the secondary is formed by cc. The variation of current produced by B's transmitter will act inductively through the repeating coils, and produce a corresponding variation of current in A's circuit, thus actuating his receiver.

TELL TELEPHONY your needs in the line of equipment or supplies. It is an important part of our business to connect you immediately with the manufacturers, bringing you quotations, printed matter, samples, etc., in profusion, without trouble or expense to you. Nothing is too small to be given careful thought and attention. Competitive prices are always desirable.

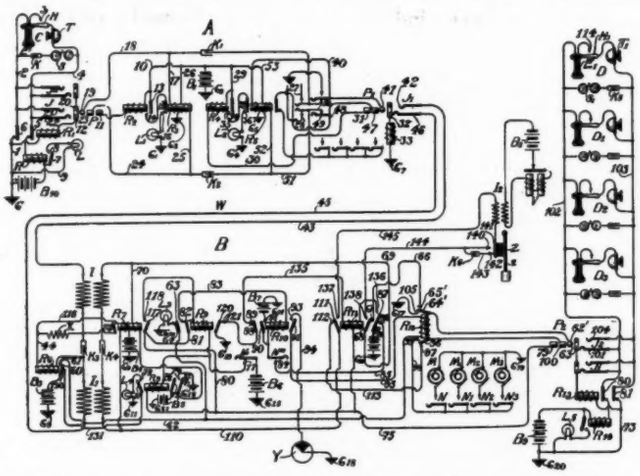
From the Patent Office

Max W. Zabel

Telephone System.

F. B. Allen, Elyria, O., Patent 999,729, Aug. 8, 1911, Assigned to Dean Electric Co., Elyria, O.

A central energy trunk system is described herein in which test means are provided to signal to the calling subscriber automatically that a line with which the operator

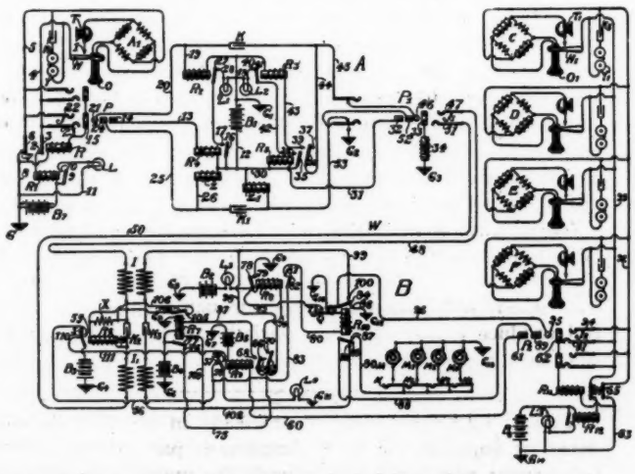


has by mistake connected the calling subscriber is busy. Should the B operator fail to make a test and insert the plug into a busy line, as for instance by inserting the plug P^2 into the jack J^2 although the line is busy, then the ring 63_1 will be at a potential higher than ground owing to the presence of a plug in the multiple jack. Current will thereupon flow through the winding of relay R^{11}. Switch 86-87 is opened preventing the making of a circuit through R^{10} when the master spring M^{11} is actuated. Circuit through relay R^{11} is locked. The trunk circuit is broken at 67-68, 111-112 and the vibrator Z is connected into the trunk circuit at 111-137 and 68-138. A busy signal is thus transmitted to the calling subscriber.

Telephone System.

F. B. Allen, Elyria, O., Patent 999,728, Aug. 8, 1911, Assigned to Dean Electric Co., Elyria, O.

This invention is designed for service between trunk

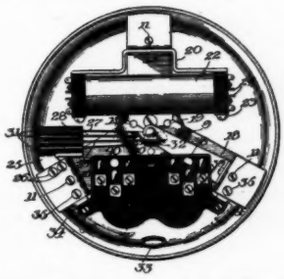


exchanges and is further designed to facilitate manipulation of the various devices. The line and cut off relays are shown at R^1 and R. A represents a three conductor cord circuit. The tip supervisory relays are shown at R^2 and R^3. Z and Z^1 represent retarding coils adapted to choke out the variations of the battery current and also the talking current. At the B position the trunk is divided into two sections conductively separated but inductively united by coils I and I^1. R^9 is the trunk relay controlled over the A end of the trunk. X represents a high non-inductive resistance normally in circuit with this relay but adapted to be shunted out. The relay R^8 when energized is adapted to control various circuits, whereby signaling may be effected through the bell Y^1 and this circuit is made each time the ringing switch M and master switch Q are operated. This relay is self locking. R^9 represents the terminal relay controlled from the Bend of the trunk. R^{10} represents the signaling relay. L^4 is the guard signal which performs the function of a disconnect signal and indicates to the B. operator that fact the plug P^1 has been inserted in the jack J^1.

Portable Telephone.

N. Pedersen, Genoa, Ill., Patent 999,859, Aug. 8, 1911, Assigned to Cracraft, Leich Electric Co., Genoa, Ill.

A desk telephone construction is set forth herein in which a suitable bell shaped base is provided with three radial arms 8, which by means of screws are held together with the said base and the stem. The radial arms hold



the apparatus, one of the arms holding the induction coil 22, the other arm by means of the bracket 25 holding the springs, and two of the arms holding the terminal plate 37. One of the springs is provided with a roller 32 against which a plunger provided within the stand acts to move the switching springs in answer to movements of the switch-hook lever.

Transmission System.

G. C. Cummings, Western Springs, and A. Wray, Chicago, Ill., Patent 1,000,077, Aug. 8, 1911.

A transmission system adapted especially for railway service is set forth herein. The system is designed so that calls may be sent even though the line is in use for talking purposes. By means of the devices the dispatcher may signal all of the receiving stations, one of said stations, or any plurality of said stations by mechanism which will not interfere with the conversational qualities of the line. Electro magnetic means are provided at each station which are successively operated and which partially control the signaling circuit, and a second set of instrumentalities are provided at the receiving stations and complete the control over the signal circuit. Means controlled at the transmitting station are provided for causing the operation of one of the second set of instrumentalities at the selected station to have it co-operate with one of the first set of instrumentalities located at the selected station to effect the operation of the electro magnetically controlled calling devices thereat.

Legal Cases and Decisions

By A. H. McMillan

Addition of Penalty for Non-Payment Is Legal.

Section IV of our franchise reads as follows:

"It is further agreed that no greater charge shall be made upon subscribers for telephones than two dollars per month for each instrument."

At present our residence rate is $1.25 per month and our business rate $2. In order to secure speedier and more prompt collections we want to add twenty-five cents to the residence rate—thus making it $1.50—unless paid by the tenth of the month, which increase is permissible under our franchise.

But as our business rate is up to the limit of the franchise we cannot under the law increase it. Can we, however, add a penalty of twenty-five cents for failure to pay before the tenth of the month, as we are proposing to do in the case of the residence rate, thus making the business rate in such cases $2.25 per month"

It has been held in a western state that a rule of a telephone company requiring payment of rentals in advance and imposing an extra charge in case of non-payment by the tenth of the following month is reasonable and enforceable, even though the extra charge makes the total sum to be paid by the subscriber exceed the maximum rate fixed by the company's franchise. The extra charge, in such a case, was held not to be an addition to the maximum charge provided in the franchise, but a charge for delinquency. State vs. Independent Telephone Co. (Oregon), 109 P., 366. If the Supreme Court of Indiana followed the reasoning of the Supreme Court of Oregon in the case above mentioned, you could do as you propose.

Trimming Trees in Nebraska.

We would like some light on the law as to trimming trees in the towns in the state of Nebraska, as in the case of our own town some parties here claim damages to the amount of $50 for two or three trees. Do we have to pay this damage and what would you suggest would be the best way to fix this matter up? It is a question in my mind who owns the trees, as it is on the property of the town, given to the lot owner only as a part of the street to plant trees and put his sidewalk.

We advise you to make a settlement of this matter for the least sum possible. It has been held in Nebraska that a telephone company cannot cut shade trees that line the streets without the permission of the owner, as the owner's title extends to the center of the street, even though the franchise permits the use of the side of the streets and no necessary damage is done. A company has been held liable for even necessary injuries. Bronson vs. Albion Telephone Co., 60 Y. R. A., 426.

Free Telephones in Illinois Depots.

I wish to ask through your paper if there is any law in the State of Illinois against telephone companies giving free telephone service to railroad depots?

We know of no such law.

Where Lineman Knows Danger, He Takes Risk.

Where it was the business of a lineman, employed by a telephone company to erect poles, string wires and keep them in condition and he knew the bad condition of the wires of an electric light company which were carried upon the poles, and had no special or positive directions from any superior employee to do work on the pole where he was killed by receiving an electric shock from a wire of the electric company, there can be no recovery for his death. So held the Kentucky court of appeals in a recent case. Anglea's Adm'x. v. East Tennessee Telephone Co., 134 S. W. 1119.

An Exclusive Hotel Contract.

As an old subscriber, I wish to ask if you can refer me to any decisions, recent or otherwise, bearing on a case like the following:

A hotel located here has been induced to sign a contract with the Bell Telephone Co., which provides that the hotel company shall purchase and have installed at its own cost a private branch switchboard with telephones located in various parts of the building and with trunk lines connecting with the exchange of the telephone company for the purpose of serving the guests of the hotel and such of the public as may desire to communicate with the hotel or its guests.

The contract provides further that the hotel company shall not attach or permit to be attached to said private branch switchboard the telephones or trunk lines of any telephone company other than the Bell, except with the permission of the said telephone company.

The hotel company has purchased and provided the private branch switchboard and telephones and has had them installed in the hotel building at its own cost and the said switchboard and telephones connected therewith are now being used in connection with the Bell company as provided in its contract.

Our telephone company is operating an exchange in this vicinity and has in service within the territory covered about 2,500 telephones, and has connection with telephones of other companies within said territory, making in all about 5,000 telephones. This condition makes it desirable for the hotel company mentioned to have connection with our company, and it is considering the advisability of permitting us to run our trunk lines into the private branch switchboard notwithstanding the conditions mentioned in the above described contract.

We have been looking up authorities on the point and the most recent case that we find reported is that of the Yates Hotel in Syracuse, N. Y., the account of which is published in TELEPHONY, July 9, 1910. The case, however, does not seem to be on all fours with our case as it appears that the Yates Hotel Co. did not own the private branch switchboard and telephones; besides we note that the decision in the Yates hotel case was still subject to further appeal.

We would like to ask if you know whether the Yates hotel case was appealed to a higher court and, if so, with what result and where reported?

The Yates Hotel Co., case, which held the exclusive feature of the contract illegal, has not been appealed so far as we know. It seems not so strong a case as that of yours from the very reason you mention, viz.: that the company did not own its instruments. There is less reason for permitting one company to dictate to a subscriber the other telephone service he shall have when the subscriber owns his own instrument than there is when the subscriber is using the instrument of the telephone company. The Yates Hotel case is the only case we know of that is in point. It gives the key to other similar decisions.

Another Pennsylvania Pole Tax Decision.

The Superior Court of Pennsylvania, on July 13, handed down a decision on the subject of pole taxes. Some time ago the Borough of Nanticoke levied a tax of twenty-five cents on a telephone company for every pole within the borough and $1 for every mile of wire. The telephone company appealed and when the case came up for trial in the lower court, the judge cut the pole tax in two and entirely eliminated the tax on the wires. The borough appealed from this decision, but it was affirmed by the superior court.

From Factory and Salesroom

Convention: North Dakota, Bismarck, September 27, 28

Kellogg Representative in New York State.

The Kellogg Switchboard & Supply Co., Chicago, takes pleasure in announcing that, on August 15, H. W. Wightman became the representative of the company in New York state. Mr. Wightman takes the place of Mr. Wurslin, who is leaving on a European trip.

Mr. Wightman has been actively engaged in the tele-

Mr. H. W. Wightman.

phone field for nine years, in which time he has had thorough experience in the operating, construction and selling phases of the work. He is a conservative, practical business man, as well as telephone worker; the kind of man who enjoys solving difficult telephone problems, both technical and commercial, because of his keen personal interest in the science.

Mr. Wightman has satisfactorily managed a number of successful companies' exchange. He was with the Federal Telephone & Telegraph Co., as exchange manager, for about five years and for the last two has been representative for the Ericsson Manufacturing Co., in Missouri and Kansas, where he has a wide circle of friends, as well as in New York, his home state.

His experience includes a wide variety of exchange installing and operation, and the company's customers and friends will find him eager to co-operate with them.

A Good Book on Local Battery Telephones.

The practical equipment education of a telephone man, we venture to say, is guided fully as much by literature of manufacturers and talks with salesmen as by any other factor. And the higher the quality of the information distributed by the manufacturer, the more will it contribute to the training in essentials of the men who read it, and the greater will be their ability to make their purchase with sound common sense. So there is a very logical reason for the creation of good descriptive matter as an aid to the selling of first class telephone equipment.

"Local Battery Telephones" is the subject of a book just issued with the supplementary title of Bulletin 1002, by the Stromberg-Carlson Telephone Manufacturing Co., of Rochester, N. Y. Although not as thick as the dictionary, none the less the quality of the matter within its covers entitles it to be called truly a book. It presents the standardized equipment for magneto telephone service turned out at the big factory in Rochester.

The form of description adopted is a straightforward statement of facts in the fewest words possible. There are no glittering generalities. The company tells what it has, and what it will do and why in short sentences, of short words. Every statement can be checked up. The company has issued a book which states its claims squarely, in a way which convinces one that it is sure it can stand behind them as indeed it can and does.

The engineering talent which produces the Stromberg-Carlson "Quality apparatus" has evidently been drawn upon for the matter which appears in the book on magneto telephones. Simple accurate answers are given to the questions which the average telephone man is likely to ask about equipment. For example, it tells how the company judges a transmitter by both the volume and articulation of speech; just how money is saved to purchasers by packing telephones in individual boxes; the method of preparing high grade woodwork; how long life is given to receiver magnets; the special method of obtaining uniform adjustment of air gaps; the reason why it is impossible to buckle or distort a receiver diaphragm; full descriptions of the non-interfering, center checking, sure ring, biased ringer, and harmonic party line telephone systems, and dozens of other matters which will be new to many, and which others, familiar with them in a general way, will desire to have close at hand for detailed information from time to time.

As an example of book making this bulletin is an exceptionally creditable production.

From cover to cover every page will be found to contain matter of interest and value to the practical telephone man, and the average recipient will not be content to lay it aside until he has read it over very carefully several times, and absorbed the many points of detail which are so carefully presented. After doing this he will understand that he has been reading a work turned out by capable, experienced and ingenious engineers co-operating in an especially efficient manner with a reliable and progressive sales and advertising department.

Copies of the book have already been sent out to all persons whose names are on the company's mailing list. Those who have not received a book may obtain one free, in spite of its very considerable cost and value, by applying to the nearest office of the Stromberg-Carlson company.

The Hazard Manufacturing Co., Wilkes-Barre, Pa., has just issued an attractive booklet devoted to insulated wires and cables. The principal wire products made by this company, including bare and insulated cables and wires, weatherproof wires and cables, annunciator and magnet wire, and special cords and cables for various industrial and railway uses, are described and fully illustrated. A copy of the booklet will be mailed on request.

Frank B. Hall, the manufacturer of telephone specialties at Newton Falls, Ohio, reports a steady increase of business in all lines and especially in T brackets and Mica fuses. Mr. Hall is very well pleased with the summer's business and believes that fall trade will be brisk.

Condensed News Reports

Officers of companies are earnestly requested to forward us promptly all financial and other statements as soon as issued and any items of interest as to their plants and systems

PERSONAL.

M. J. STIMSON, division commercial superintendent at Dallas, Tex., is to be made division superintendent of Arkansas, a new post created by the Southwestern Telephone & Telegraph Co. with headquarters at Little Rock.

PROF. I. N. SMITH, special agent for the Home Telephone & Telegraph Co., Pasadena, Cal., severs his connection with the company and after taking a short rest will take up his duties as secretary to the mayor of Pasadena.

EDWARD E. BACKUS has severed his connection with the U. S. Electric Co. to accept the position of signal engineer of the El Paso and Southwestern Railroad, El Paso, Texas, operating lines in Mexico, Texas, Arizona, New Mexico and California.

Word has just passed around that CHARLES R. YUND, vice-president of the Spinks Corners Telephone Co., Benton Harbor, Mich., was married May 10th to Miss Blanch Baley. His friends in the field will join with TELEPHONY in wishing the couple much happiness and good luck.

O. M. OGILVIE, assistant secretary to the British Post Office, has been appointed to the newly created post of third secretary. He will have supervision over the transfer of the telephone system to the Post Office, and it will be his duty to secure co-ordination of the telegraph and telephone department.

ROBERT BURNS, who has held responsible positions in the Plant and Traffic Departments of the Chicago Telephone Co., Chicago, Ill., for the past six years, and served as president of the Chicago Telephone Technical Club for two years, is receiving the support of his friends for election as representative in the State Legislature from the 19th Senatorial District.

H. W. RAMSAY SHARP was appointed by the Postmaster General of Australia to investigate the causes for criticisms of telephone service at Sydney, N. S. W. Mr. Paxton, president of the Sydney Chamber of Commerce, in a recent address discussed the telephone troubles and advised the appointment of a Commission composed of men having wide business experience to manage the Government telephone department.

NEW COMPANIES.

LINDEN, ALA.—The Linden and Nanafalia Telephone Co. has been incorporated by I. L. Hasty, W. C. Dozier, B. F. Gilder, and W. F. Rhodes. Capital, $1,000.

ASTORIA, ILL.—The Peoples Telephone and Telegraph Co. has been organized. Capital stock, $10,000. It will take over the local lines in Menard county.

OFFELE, KANS.—The Peoples Co-operative Telephone Co. has been incorporated. Capital, $10,000.

IMMANUEL, KY.—George Stacy and Henry Napier are organizing a company to build a telephone system.

PADUCAH, KY.—Articles of incorporation have been filed by the West Kentucky Long Distance Telephone Co., the capital stock being $500. The company is organized for the purpose of operating a line between Paducah and Cairo, Ill. L. C. Griffiths, Louisville, is one of the incorporators.

LONG PRAIRIE, MINN.—The Roddis Telephone Co. was recently incorporated by David Roddis, president; Louis H. Roddis, vice-president, and G. B. Roddis, secretary and treasurer.

HARDIN, MONT.—The Big Horn Telephone Co. has been incorporated. Capital, $20,000, par value of shares $50. Officers are: President, D. A. Kamp, Hardin; vice-president, G. F. Corwin, Foster; secretary, C. A. Lee, Hardin; and H. H. Cone, Foster, director.

GASTONIA, N. C.—The Gaston County Farmers' Union organized the Gaston Rural Telephone Co. to construct a telephone system.

ROLLA, N. D.—The Rolla Rural Telephone Co. has been incorporated. Capital stock, $10,000. Incorporators are: A. O. Graham, Arthur Dixon, and Robert Frazer.

BLOOMSBURG, PA.—The Derr Waller & Benton Telephone Co. has recently been incorporated.

CONNELLSVILLE, PA.—The Fayette Rural Telephone Co. has recently been incorporated. The organizers are Ernest McC. Overholt, W. R. Bungard, William Hay, John C. Milligan and John B. Truxel. The company is to build a system of lines through the rural districts of Westmoreland and Fayette counties.

COLUMBIA, S. C.—A charter has been granted the Olanta Telephone Co., of Olanta. Capital stock $600. The officers are F. B. Thomas, president; S. P. Tomilson, vice-president, secretary and treasurer.

CORPUS CHRISTI, TEX.—The Nueces River Telephone Co. has recently been incorporated by Vincent Bluntzer, John Elliott, C. C. Wright, W. G. Sutherland and Edward Kleberg. Telephone lines will be constructed up to the Nueces river to Calallen.

PALESTINE, TEX.—J. R. Boykin is president, and D. B. Boykin, general manager of a newly organized company which has taken over the control of lines from Crystal Lake to Alder Branch.

CLAYTON, WASH.—Articles of incorporation of the Big Foot Valley Telephone Co. have been filed.

ROCK FALLS, WIS. (R. D. Careyville).—A charter has been granted the Rock Falls & Meridian Telephone Co. The incorporators are L. E. Hogue, J. P. Fossum and Gilbert Jevine. The capital stock is $5,000.

FINANCIAL.

TRUMP, IND.—The Union Telephone Co. has been granted authority by the Public Service Commission to issue $1000 of stock to pay for improvements already made.

PRESTONSBURG, KY.—The Sandy Valley Telephone Co. has increased its capital stock from $5,000 to $10,000. Toll lines will be built to Hindman and Paintsville.

FT. WORTH, TEX.—The Brazos Telephone Co., of Velasco, has amended its charter to decrease its capital stock from $10,000 to $5,000.

FRANCHISES.

ATHENS, ILL.—A franchise has been granted to the People's Telephone and Telegraph Co.

FESSENDEN, N. D.—The Maple Leaf Telephone Co. has been granted a franchise to extend its telephone lines.

DAYTON, WASH.—The Mount Vernon Telephone Co. has asked for an exclusive franchise granting it the right to erect poles and build telephone lines along Mustard and Sixth streets in Dayton, connecting with its line along the Eckler Mountain road.

CHEYENNE, WYO.—The Automatic Telephone Co., of which Robert N. La Fontaine is at the head, has applied to the city council for a franchise.

CONSTRUCTION.

PHOENIX, ARIZ.—The Arizona Telephone & Telegraph Co. will shortly undertake a number of important improvements in various parts of the territory in which its wires are working. The company has decided to build a copper long-distance circuit from Phoenix to Hayden, and then a continuance to Winkelman. higher altitudes of the Bitter Root range.

STITES, IDA.—Telephone lines in the Selway national forest with headquarters at Kooskia are being nearly doubled in length and trebled in efficiency. The existing 80 miles of telephone wires are being increased to 140 miles and tap important points not heretofore reached. Three new ranger stations are also being constructed, one being a large winter headquarters on O'Hara bar, with two smaller houses for summer use in the

INDIANOLA, FLA.—The Brevard County Telephone Co. has laid a cable to Merritt Island, and is now in operation in Indianola, Merritt and Georgiana. Work will begin to extend the line to Courtenay.

MACOMB, ILL.—The Illinois Western Telephone Co. has under way plans for extensive improvements and extensions to its system. Several carloads of poles and of wire have already been purchased.

MORRISON, ILL.—The Interstate Telephone Co. will build a new copper line connecting Sterling with Aurora, and a line connecting Sterling with Morrison.

BONNER SPRINGS, KANS.—The Wyandotte County Telephone Co. is rebuilding its entire system, making it all cable. A new switchboard has been purchased.

PINE TOP, KY.—The Carr's Fork Telephone Co. will build a metallic line from Pine Top to Hindman and Sassafras, connecting there with lines to Hazard. The company has increased its capital stock from $3,500 to $5,000. S. R. Blair is manager of the company.

WHITESBURG, KY.—The Whitesburg Telephone Co. here will build local and long distance lines from Craftsville via Wright and Bentley to Jenkins, Ky., connecting with the Eastern Kentucky Home Telephone Co.'s lines to Pound, Va. N. Starkey is manager of the company.

BENTON HARBOR, MICH.—The Spinks Corners Telephone Co. is rebuilding its rural lines out of Benton Harbor.

WAUSAU, NEBR.—The Union Telephone Co. is making preparations to erect a new office building. It is to be a 30x48

feet, brick building, and to have two stories and a basement The first floor will be occupied by the post office, while the second floor will have the telephone exchange and private office rooms.

ELY, NEV.—Forest service employes are at present busy stringing the telephone wires which will connect the Berry Creek Range stations with Ely and Smelterville and it is expected the work will be completed and the telephone line installed and in working order in a short time. Arrangements have been made with the government whereby the ranchers and people located in proximity to the line may be "cut in."

JOSEPH, ORE.—The Wallowa County Forest Reserve, of which J. F. McClain is superintendent, will build a telephone line to the Rangers camp, a distance of fifteen miles from Joseph.

HUSUM, WASH.- A telephone line for the use of forest rangers is to be constructed from Carson, in Skamania county, to Trout Lake.

PASCO, WASH.—The Twin City Telephone Co. will rebuild its system this fall, making it an all cable plant. About $30,000 will be spent on the improvements. R. A. Klinge is president and manager of the company.

ELECTIONS.

OZARK, ARK.—Reports of officials at the annual meeting of the Home Telephone Co. held recently, show that there are over 1,000 telephones in use in Ozark. The company, which also controls the Altus-Denning exchange, now has direct connection with more than 1,500 telephones through the two exchanges. D. B. Anderson was selected as manager, and the following directors were chosen: M. B. Conatser, J. T. Green, L. L. Ford, W. L. Wagner and W. C. Conatser.

WAVERLY, ILLS.—The following officers were elected by the stockholders of the Waverly Telephone Co.: H. I. De Turk, president; M. Van Winkle, vice-president; A. C. Moffett, treasurer, and A. L. Hamilton, secretary. Directors are A. L. Hamilton, A. C. Moffett, W. B. Rogers, and A. W. Regal.

ROSE HILL, IA.—The telephone line No. 11 held a meeting and elected Andrew Larson president.

KENSINGTON, KANS.—The annual meeting of the Farmers Co-operative Telephone Association was recently held. The following officers were elected for the coming year: N. G. Sawyer, president; H. Santrock, vice-president; H. Grauerholz, secretary; L. C. Ahlborn, treasurer. The directors ahe A. H. Day, H. Morehead, Sam Walter, Ola Scott and L. Chance.

ZEELAND, MICH.—At the annual meeting of the Drenthe Telephone Co., officers were elected as follows: H. A. Lanning, president ;Dr. A. J. Brower, manager and secretary, and R. De Vries, treasurer.

BARRON, WIS.—Officers of the Barron County Telephone Co. have been elected as follows: Dequitt Post, president; T. W. Borum, vice-president; J. R. Horsman, secretary.

RHINELANDER, WIS.—The annual meeting of the Rhinelander Mutual Telephone Co. was recently held and the following directors were elected: Arthur Taylor, E. O. Brown, D. F. Recker, E. A. Forbes and C. F. Barnes. The directors elected the following officers: Arthur Taylor, president; E. O. Brown, vice-president; M. H. Raymond, treasurer, and Geo. F. Mahoney, secretary, and H. W. McWayne, manager.

MISCELLANEOUS.

PHOENIX, ARIZ.—The Overland Telephone & Telegraph Co. announces the operation of its Tempe Exchange. The company has installed the common battery system which gives the best service possible, with the one exception, automatic system such as Phoenix enjoys, says a local newspaper.

PASADENA, CAL.—Sealed bids for a contract to install an intercommunicating telephone system in the public schools of Pasadena, to be controlled completely through a switchboard in the headquarters of the board of education in the Chamber of Commerce building, will be opened at a meeting of the board of education. Whether action upon the bids will be taken is uncertain, but it is assured that the system will be installed before the opening of the next school year.

KOKOMO, IND.—A. J. Yawger & Company, contractors, of Indianapolis, Ind., have been awarded the contract for the grading, building, tracklaying and ballasting of the Kokomo, Frankfort & Western Traction Company line from Kokomo to Frankfort. The work was begun August 2. The company has headquarters at Forest. The total length of the line is twenty-six miles.

LA FAYETTE, IND.—The La Fayette Telephone Co. will commence changing its city party telephones from the magneto code to harmonic ringing isystem.

CHAPMAN, KAN.—The Brown Telephone Co. and the Farmers' Mutual Telephone Co. will consolidate and form a stock company. The Farmers' Mutual Telephone Co. will be discontinued and all business done through the Brown Telephone Co.

LOUISVILLE, KY.—A new telephone switchboard for the new operating room of the fire alarm system is to be recommended to the Board of Public Safety. A board is wanted which will enable the tower man at the fire department headquarters to get into touch with half a dozen or more engine houses at the same time, deliver general instructions to all without having to call each engine house individually.

HANNIBAL, MO.—The Bluff City Telephone Co sold its plant to Ben C. Hyde, of Kansas City. The capital stock is $100,000, and Mr. Hyde purchased $90,000 of the stock, and contemplates enlarging the plant extensively.

GREAT FALLS, MONT.—The Kootenai national forest, centering at Libby, has completed a telephone line from the Swamp creek range station to the headquarters here, a distance of 26 miles. Another line is being strung from Sylvanite up the Yaki river to the Olson ranger station, a distance of 21 miles.

ALBANY, N. Y.—The Delaware & Otsego Telephone Co. has purchased through Irving H. Griswold, of Albany, the Oneonta Home Telephone Co. Mr. Griswold is vice-president of the Otsego company. The Otsego Home Telephone Co. has issued bonds to the amount of $150,000, of which about $100,000 are outstanding.

BLACKBURN, OKLA.—The Blackburn Telephone Co., with exchanges at Skedoe, Maramec and Hallett, has recently been sold to Link Dupuy, of Altoona, Kan., and Jasper Coats, of Rest, Kan.

LUCIEN, OKLA.—Oliver & Alloway have bought all interests held by the Oklahoma Home Telephone Co. at Lucien, Okla., and are installing a good, up-to-date plant. The new name of the company will be Lucien Telephone Exchange.

BRENHAM, TEXAS.—The Long Point Telephone Co. is extending its lines from Gray Hill toward Independence and is contemplating still further extension. The company now owns 65 miles of telephone lines in the county. A movement is pending in Washington county to organize the numerous rural telephone lines into a single company and run independent of the local exchange. No definite arrangements have yet been made.

PARIS, TEX.—The Board of Trade of Paris is giving its support to a proposed interurban electric railway that is to be constructed between this place and Sherman, Tex. The sum of $10,000 has been subscribed towards a total fund of $30,000 to pay the cost of the preliminary survey.

PORTLAND, TEX.—The Portland-Rosita Telephone Co., has been sold to Messrs. Arnold and Rachal, who are now rebuilding and otherwise improving the property.

HOUSTON, TEXAS.—E. D. Selmser reports that progress on the new Independent system at Houston is being made in a way very gratifying to Texas Independents. Automatic switches and telephones are being installed and cable run under the direction of the Ebersole Brothers. Mr. Selmser says: "They are doing double A1 work, as fine as I have ever seen."

SEOUL, KOREA.—The Japanese provincial government in Korea (Chosen) has under consideration a scheme for installing, at a cost of over $55,000, a long distance telephone between Seoul and Fuisan, in addition to the existing telephone service connecting Seoul, Shigen and Makan. It has been decided to inaugurate the service in the course of the current year.

MISCELLANEOUS.

ATKINS, ARK.—L. E. Carmichael of Heber Springs has purchased and taken charge of the Atkins telephone system. The grounded system will be replaced by a metallic.

WASHINGTON, D. C.—It has been reported that the Grand Trunk Pacific Railway has awarded a contract (contractor's address obtainable from Bureau of Manufactures) for constructing the uncompleted 415-mile gap in British Columbia extending from Tete Juan Cache (50 miles west of Yellowhead Pass) to Aldermere in Bulkeley Valley.

ABBEVILLE, GA.—The Abbeville telephone system has been sold to Mr. William R. Bowen of Fitzgerald, for the sum of $5,000. Mr. Bowen owns the Bowen telephone system of Fitzgerald, and the Rochelle system. This purchase gives Mr. Bowen connection via Abbeville to Pine View, Finleyson and Hawkinsville, he proposes to improve the Abbeville system, by putting in new telephones.

SPRINGFIELD, ILL.—The first concrete telephone pole to be erected in Springfield has been placed in position in Washington street. The pole is thirty feet in length, twenty-five of which is above the street line.

STERLING, ILL.—The Bureau County Independent Telephone Co. will begin constructing underground conduits to care for the lines connected with the central office.

DAVENPORT, IA.—The Iowa Telephone Co. has let a contract for the installation of its underground conduits in northeast and west Davenport. The contract price for the contract is $16,000.

OWENSBORO, KY.—The Owensboro Home Telephone Co. is engaged in erecting a conduit for the placing of wires below the surface of the ground on Fourth and St. Ann Sts.

ANSLEY, NEBR.—The Ansley Telephone Co. has just completed the installaton of a new 75 drop switchboard in its Berwyn exchange. The company has about 60 subscribers there at the present, and prospects for a very rapid increase are very bright.

BRIDGETON, N. J.—The Delaware & Atlantic Telephone Co. asked Bridgeton Council for a 50-year franchise to bury all of its overhead wires in conduits.

READING, PA.—The Bell Telephone Company is placing its wires underground and a further appropriation of 15,000 has been made which will be expended on additional underground and aerial cable work.

PORT LAVACA, TEX.—The Port Lavaca Telephone Co. is constructing an underground system; 3,000 feet of cable will be laid.

In the Rural Line District

According to notices posted on the telephones in Cuba, all persons not having telephones will be compelled to pay 10 cents if they use a neighbor's 'phone and the owner of the 'phone will be held responsible for the pay. The little posters have aroused quite a storm, as one man expressed it: "They can put it on our bills, but they will play h——l collecting it."—*Cuba (Ill.) Journal.*

F. E. Griffing, who makes his living by "seeking trouble" for the Independent Telephone Co. of Omaha, is visiting old-time friends here. He has been engaged in the telephone work in Omaha for nearly ten years and likes his work very much.—*Table Rock (Neb.) Argus.*

Roscoe Smith, of San Jose, manager of the telephone lines at Hopedale, called at the Emden telephone exchange Saturday. We are pleased to say that after spending the time between 9 a. m. and 12 o'clock noon at the switchboard he left the office in a happy frame of mind and everything working fine. Something must have gone wrong during Sunday, for he appeared again on Monday morning and after an hour's conversation left for Hopedale.—*Emden (Ill.) News.*

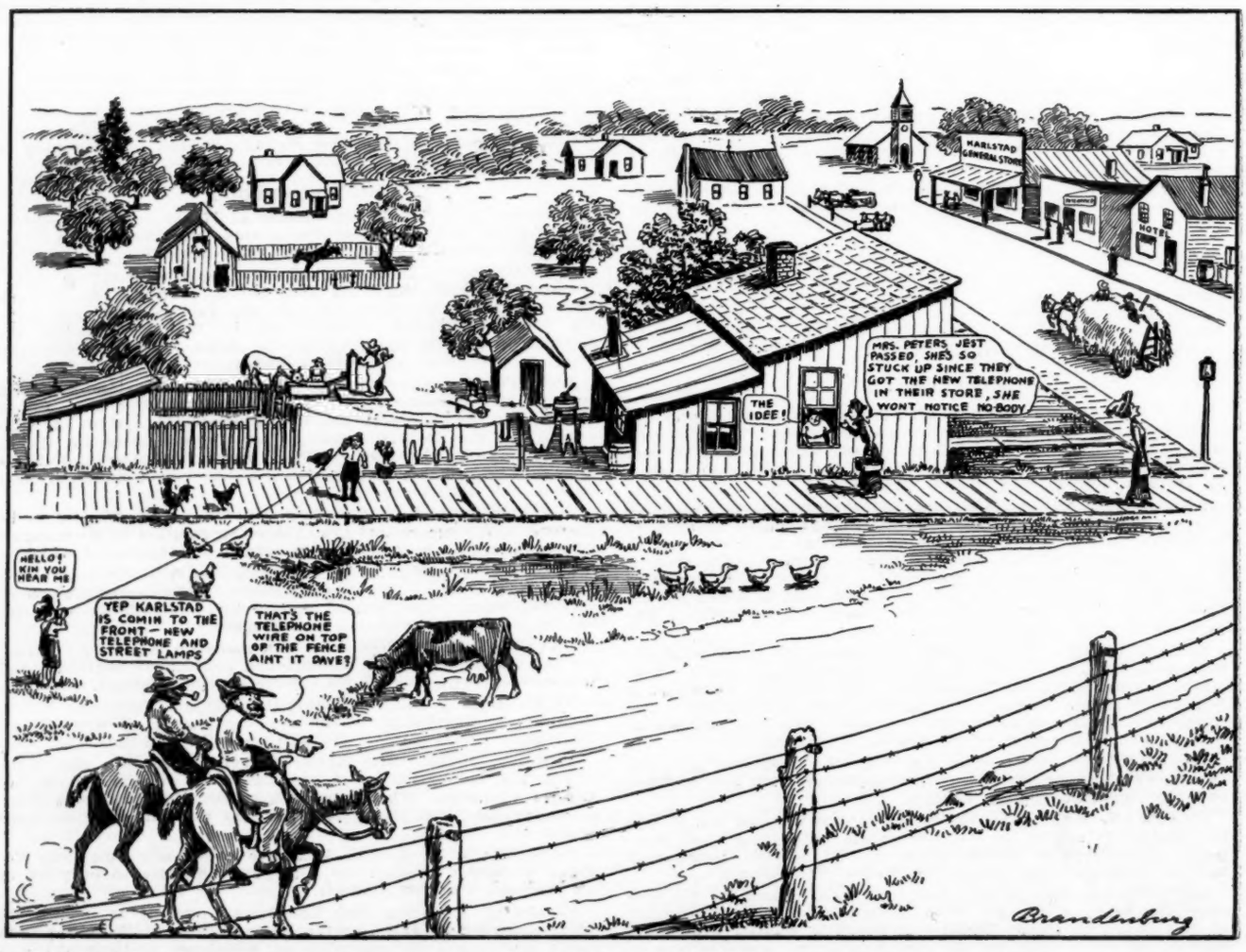
Fred Hansen, the telephone man, was over to Lincoln last of last week on some business matters. He returned Saturday afternoon. While there he saw the engine that ran into the depot and smashed things up generally.—*Plainview (Neb.) Republican.*

Supt. Dillon has been after the telephone company for some time in regard to removing several stumps of line posts left on paved streets. But great bodies move with slowness, and finally Mr. Dillon took the best horn of the dilemma yesterday morning, himself cutting the stumps off to the paving level, and he did a good job.—*Mendota (Ill.) Reporter.*

Editor Tuck was off duty this afternoon and accompanied Secretary Ralph Wolfrom, of the Local Telephone company, on an automobile trip to Berlin Heights. It was only recently that Berlin Heights was given high honors among all the places of the earth as the abiding place of more widows to the square inch than anywhere else, but we do not know that that has anything to do with the editor's going there.—*Bellevue (Ohio) Gazette.*

The officials and phone holders joined hands Tuesday and began the work of replacing some of the shaky poles with those imported a few weeks ago from the icy pineries. From the standpoint of length the poles are short horses, but the boys are planting them rapidly and the fellows with cob pipes in the gang of workmen seem happy as jay birds in pokeberry time.—*Olney (Ill.) Advocate.*

The telephone central is in good working order in Miss Edna Morley's home. The people were glad to hear "Hello" from the switchboard again after the fire.—*Yorktown Correspondence Clarinda (Ia.) Herald.*


KARLSTAD GENERAL STORE
HOTEL
MRS. PETERS JEST PASSED, SHE'S SO STUCK UP SINCE THEY GOT THE NEW TELEPHONE IN THEIR STORE, SHE WONT NOTICE NO BODY
THE IDEE!
HELLO! KIN YOU HEAR ME
YEP KARLSTAD IS COMIN TO THE FRONT — NEW TELEPHONE AND STREET LAMPS
THAT'S THE TELEPHONE WIRE ON TOP OF THE FENCE AINT IT DAVE?
Brandenburg

Karlstad, in Kittson county, is now connected with the outside word by telephone. At present the wire is strung on fence posts, but the *Advocate* says that if the experiment is successful a regular line will be built. How would you like to live in Karlstad?—*Argyle (Minn.) Banner.*